

ARCHIVES OF OTOLOGY.

ON GENERAL PYÆMIC INFECTION FOLLOWING AURAL SUPPURATION.

By DR. O. BRIEGER,

PHYSICIAN TO THE ALLERHEILIGEN HOSPITAL IN Breslau.

Translated by Dr. A. B. KIBBE, Seattle, Washington.

I.—PYÆMIA WITHOUT SINUS-PHLEBITIS.

OUR views on the relation of otogenous pyæmia to sinus-phlebitis have become essentially broadened in recent times. While up to the last four years the onset of the symptoms of pyæmia was sufficient for the diagnosis of sinus-phlebitis, it is now definitely established that the complex of symptoms of pyæmia may be associated with aural suppuration without the agency of thrombosis of a cerebral sinus. Along with the relatively frequent form of pyæmia, which, like acute infectious osteo-myelitis, is caused by osteo-phlebitis, a third rare form of septico-pyæmic infection has been described by A. Fraenkel and designated as a *dermato-myositis*. Under the same title, Unverricht had described a peculiar complex of symptoms, the characteristic evidences of which he took to be multiple myositides and peculiar changes in the overlying skin. In his cases the autopsy revealed a peculiar jelly-like œdema of the affected muscle which was permeated with hemorrhages, imbedded in a highly œdematous perimysium, and covered with œdematous and often erysipelatoid-colored skin, but never showed any tendency to suppuration. This absence of actual suppuration distinguishes this form of myositis from the abscesses of muscles which occur with relative frequency

in the course of pyæmia. In one case occurring in my hospital practice, the characteristic symptoms of dermato-myositis were decisive only a few days before death, though the actual beginning was clearly some time earlier.

G. B., aged, thirty-nine, chronic suppuration of middle ear, large kidney-shaped perforation. Fistula above short process. Markedly anæmic, complains of weakness which has existed for some time. Frequent chills. After twelve days' treatment, hammer was excised without narcosis. Entered hospital eight days after operation on account of weakness and elevation of temperature to 39.2° C. The left forearm, particularly on the flexor side, showed marked œdema; slightly less on the right arm and forearm. On the left forearm diffuse reddish discoloration of the skin. Slight œdema of both thighs near the knees. Temperature persistently high, once 41.5° C., irregularly remittent without typical rigors. His condition became gradually worse, and death took place fourteen days after the excision of the hammer.

Autopsy.—Small coagulum in the left lateral sinus. Left drum-head totally wanting. Granulations springing from the Rivinian segment. Mucosa of middle ear otherwise pale and covered with a thin layer of non-fœtid pus. Organ of hearing otherwise without change. On the flexor surface of both forearms extensive œdematous infiltration of the skin and subcutaneous tissue; in the latter numerous hemorrhages, the muscles infiltrated and strewn with small hemorrhages. Thin brownish-yellow fluid exudes on pressure, but no pus. A similar condition was found on the extensor surface of both thighs.

Clinically, this case corresponds throughout with Unverricht's description of the disease, anatomically also it corresponds in the main. Particular explanation, however, may be required of the presence of a coagulum in the left lateral sinus. This I took to be a post-mortem clot.

Muscle metastases in otogenous pyæmia are in themselves nothing rare, but in all cases of this nature abscess formation takes place rapidly. Here, in spite of the long standing of the process, nothing of a purulent nature was to be discovered. The peculiar behavior of the metastases in muscles is the point which principally distinguishes this form from the common variety of otogenous pyæmia. In addition to the

changes in the skin, it is the normal condition of the cerebral vessels which forms the basis of the classification. It is apparent, therefore, that the integrity of the sinuses must be established by an examination of all the vessels.

Another form of otogenous infection which in its symptoms stands in close relation to the pyæmia induced by sinus-phlebitis, was first taught us more exactly by Koerner. As in acute infectious osteo-myelitis, pyæmia may arise mainly in acute inflammatory processes by a phlebitis of the osseous vessels. That sinus-phlebitis also may take its origin from a similar cause was pointed out by Schwartze¹ in an early work. Koerner, however, ascribes to such osteo-phlebitis the power of producing pyæmia *without* involvement of the lateral sinus.

Evidence of the presence of osteo-phlebitic pyæmia is, in individual cases, very difficult to detect, and only sufficient to indicate a probability of its existence. Koerner lays special stress on the behavior of metastases, which in osteo-phlebitic pyæmia are rarely localized in the lungs, while arterial emboli are observed much more frequently than in sinus-phlebitis. Hessler's² recent article substantiates Koerner's statement that a large group of cases of otogenous pyæmia which differ clinically by the absence of all local symptoms of sinus-thrombosis, by the greater benignity of the entire disease picture, and by the unity of pulmonary metastases with relatively frequent metastatic joint and muscle involvement, indicate a special classification. This classification is not impaired by the occasional occurrence of pulmonary abscesses, which I have observed in one instance:

A. G., aged eight weeks. Previous history not obtainable. Infant greatly emaciated. Temperature normal. Right otitis media purulenta chronica. Death four days after entering hospital.

Autopsy.—Broncho-pneumonia with small sub-pleural abscesses. The lungs showed a number of grayish-red nodules, some of which were marked by a suppurative inflammation of the over-

¹ *Archiv für Ohrenheilkunde*, Bd. vi., S. 220.

² *Archiv für Ohrenheilkunde*, Bd. xxxviii.

lying pleura. The centre of each was purulent and surrounded by a granular, grayish-red pneumonic zone.

Cerebral sinuses healthy. Brain presented no noteworthy change.

Wide perforation of right drumhead. Tympanic mucosa—covered with a thin layer of slightly foetid secretion—diffusely swollen and extending above the edge of the perforation in the form of pale-red granulations.

Sinus-phlebitis may here be excluded with certainty. The pulmonary abscesses must be considered as metastatic embolic foci, although plugging of the branches of the pulmonary artery could not be demonstrated, at least macroscopically. The only source to be found for these metastases was the suppuration in the mucosa of the right tympanum. Here we see a pyæmia not clinically recognizable develop without any justification for the assumption of an osteophlebitic process, apparently through the direct absorption of exciting substances from the tympanum into the blood-paths, and finding its expression in the formation of numerous embolic foci in the lungs.

The operative opening of the mastoid cavities in the absence of marked local indications, has its considerations. This is not the place to give my own experiences in early operations, but as not unimportant for the question before us, I may bring forward the fact that in operations undertaken during the early days of the disease the subjective mastoid symptoms were lessened, but the general condition was not only repeatedly uninfluenced, but increased fever and chills were observed. The local course was also more unfavorable and more tedious than usual in cases operated upon before the inflammation had reached its height and pus was demonstrable.

II.—THROMBO-PHLEBITIS OF THE LATERAL SINUS.

While the therapy of sinus-phlebitis has produced unexpected results, but little advance has been made in its diagnosis within the past five years in spite of the large number of casuistic communications. The most weighty indication of

its existence, according to our present knowledge, has been the general evidence of pyæmia, the onset of which, as a rule, first calls our attention to its development. Knowing as we now do that still another form of pyæmia without sinus phlebitis may follow middle-ear inflammation, the conclusions which we may draw from it have become more questionable and uncertain.

The diagnostic importance of the characteristic temperature curve in pyæmia, with its remissions to and below normal, and the rapid rise, usually accompanied by a chill, is unquestioned. What I have said above is directed against the diagnostic value of single rigors as they may occur in middle-ear inflammation without pyæmia. The temperature curve in sinus-phlebitis does not always follow the pyæmic type. According to my observation it is frequently so modified by co-existing local complications, that the characteristic deep remissions were less frequent or wanting. "The degree of hyperthermia does not always express, and rarely exactly, the intensity of the infection." Variations in temperature of 4° C. and over within twenty-four hours I have repeatedly observed, but never more frequently than once during the period, the cessation of fever.

A typical pyæmic temperature curve also may not prevent, in the absence of frequent rigors, a confusion with typhoid in the stage of marked variation in temperature. This is often the case in septico-pyæmic processes, as for instance in acute infectious osteo-myelitis, which has frequently been confounded with typhoid. Such an error once came under my observation. Naturally errors the reverse of this are possible in that occasionally typhoid may be confused with sinus-phlebitis owing to the simultaneous existence of aural suppuration.

Confusion with malaria and tuberculosis is also possible, as in a case of tuberculosis of the middle ear with diabetes coming under my notice, pyæmic symptoms were so developed that for two weeks a chill occurred every day at the same time, followed by an elevation of temperature lasting a few hours. Other symptoms of pyæmia were wanting even for some time after.

An important aid in the differential diagnosis between typhoid and malaria and pyæmia is the examination of the blood. Malaria is certain when the plasmodium can be demonstrated in microscopic preparations. Whether pyæmia or typhoid exist can only be decided by the demonstration of the typhoid bacillus.

Passow notes in his short case-history that prior to the operation *peptone* (by Salkowski's method) was found in the urine; after the emptying of the abscess and the extrusion of the necrotic posterior sinus wall, it was absent. *The diagnostic value* of the demonstration of peptone in endocranial complications, a more thorough discussion of which I reserve for later treatment, is restricted principally to the diagnosis of purulent meningitis and of brain abscess.

Among the most important local symptoms of sinus-phlebitis changes in the background of the eye are to be reckoned. But they are nothing specifically peculiar to this disease, not mechanically caused by it, but common to all other endo-cranial consequences of middle-ear supuration and more frequently found with them than in pure sinus-phlebitis.

Jansen¹ has observed papillitis in 31 per cent. of his cases. In 14 cases I have noted changes in the background of the eye varying from simple hyperæmia to the complete picture of choked disc seven times. Of this number three occurred in isolated thrombosis of the sinus cavernosus. Seven times the findings were negative. In but two cases with positive findings did extra-dural abscesses exist. In fact I have almost as a rule failed to find changes in the ophthalmoscopic picture in these cases in spite of a large amount of material.

The local symptoms which stand in relation to the emissaries, the œdema at the posterior border of the mastoid process (Griesinger) in the occipital and cervical regions are not the consequences of stasis in a venous area flowing into the sinus. In this they are principally to be distinguished from the swelling in the region of the brow and eyelids met with in thrombosis of the cavernous sinus. The difference is to be found in the anatomical

¹ *Zeitschrift f. Heilkunde*, 1893.

relations. While the blood stream in the emissaries flows *away* from the lateral sinus, the ophthalmic vein empties *into* the cavernous sinus. This indicates that in sinus-thrombosis the phlebitis and not the thrombosis is the primary affection. In our assumption of the genesis of sinus-thrombosis many points are not clear. Cases in which the thrombosis arises by an extension of the osteo-phlebitic process in the veins of the tympanum or dura, in the veins of the aquæductus vestibuli, or the internal auditory vein (sinus petrosus inferior or bulbus jugularis) are easily understood. The most frequent manner of development of sinus-thrombosis is by the direct extension of inflammatory processes in its wall.

The swelling between the mastoid process and cervical vertebræ is a consequence of the phlebitis, not a mechanical sequel of the thrombosis. These œdemas, possibly of toxic origin, are also so diffuse that it would be difficult, if not impossible, to place them according to their location in relation to any certain section of the thrombosed sinus. Typical development of Griesinger's symptoms—circumscribed hard infiltration extending backward from the posterior border of the mastoid process—I observed with normal sinus in a case of tuberculosis of the temporal bone originating from an isolated pus collection in a bone cell lying far back.

But all these œdemas, particularly infiltration of the muscles of the neck, occur in uncomplicated suppuration of the mastoid process, especially in the so-called Bezold mastoiditis, so frequently and in a form so completely corresponding with that swelling characteristic of sinus-phlebitis that only a qualified diagnostic value is to be attributed to them.

Extension of the thrombosis to the jugular vein is occasionally directly perceptible. In the side of the neck along the course of the large vessels a dense cord, painful upon pressure, may be felt, but this finding also, which is most often found noted in case-histories, is only to be taken with great caution. Schwartze has observed sensitiveness of the vein without any co-existing inflammatory change; apparently communicated to the vein by the adjacent lymph

plexus. Gravitation of pus may also produce a small infiltration, and simulate thrombosis of the jugular. In connection with this cord-formation along the jugular stands the pain in movements of the head in all directions, and the frequent restriction of movement, which not rarely finds its expression in the development of a *caput obstipum*. Usually the head is inclined toward the affected side.

At the end of our observations on the symptoms of sinus-thrombosis we arrive at the same results for diagnosis as have those who have recently written upon the subject. The disturbances which have been referred to as a direct local consequence of thrombo-phlebitis of the lateral sinus are not sufficiently indicative. General evidences of pyæmia are not alone characteristic of pyæmia following sinus-phlebitis. In many forms of mastoid suppuration, particularly in perforation through the lower wall of the process, we are apt to observe those symptoms of general infection which we are accustomed to look upon as pyæmic, in addition to the œdema which simulates that arising from thrombosis of the emissaries.

R. G., thirty-eight years of age. Was attacked a week prior with severe pains in right ear, initial chill the second day of the disease.

Present Condition.—Prolapse of the posterior and upper wall of the meatus, profuse discharge increased by pressure upon the mastoid, moderate swelling over the latter, which is sensitive to pressure; œdema from the posterior border of the same extending backwards almost to the median line. Anterior to the tip of the mastoid a circumscribed swelling extending downwards along the anterior border of the sterno-cleido-mastoid muscle in the form of a hard, painful cord.

Operation.—Beneath the thin cortex a large abscess cavity existed, including the antrum; perforation on the under surface; communication with a gravitation abscess by a broad fistula opening into the inferior wall of the meatus. At the bottom of the abscess in the mastoid lies the slightly discolored pulsating wall of the sinus covered with granulations. Repeated puncture of the sinus shows unchanged blood. Discharged cured two months later.

The local symptoms of extra-dural abscesses are usually so similar to those of sinus-thrombosis that in cases in which the typical pyæmic symptoms are wanting sinus-thrombosis may be easily surmised. When there exists only a collection of pus on the anterior surface of the sinus, characteristic pathognomonic evidences are not usually produced by these abscesses. Only where cerebral symptoms exist as they are observed under certain circumstances in extradural abscesses, there occurred to me in a few cases such remarkably rapid changes in the symptoms, such an inconsistency of these local as well as diffused cerebral symptoms as we scarcely see in meningitis, the symptoms in which often quickly change. In this particular the extra-dural abscesses are to be distinguished from the cerebral abscesses which accompany sinus-phlebitis in that evidences of pyæmic infection are wanting.

From the inspection of the bared sinus much was expected as to the character of its contents. As to the importance of the demonstration of gangrenous spots on the sinus wall or from fistulæ leading into its interior there exists no doubt. Judging from discoloration or from changing resistance of the sinus wall leaves much to individual measurement, and not seldom leads, according to my experience, to conclusions which by further examination of the interior of the sinus prove false. The direct palpation of the thrombus through the wall of the sinus is useless and, as a rule, without result, as in the cases with which we are dealing there is usually no longer a solid thrombus following the lumen of the sinus.

Particular weight has been laid by many authors on the action of the movements of respiration and cardiac pulsations on the sinus. The demonstration of respiratory movements succeeds so rarely on the normal sinus that from its absence it will be impossible to draw conclusions of any value for diagnosis. It is otherwise with the pulsatory movements of the sinus itself. Berthold¹ was the first to describe the venous pulse in the cerebral vessels. With this venous pulse the pulsatory movements of the sinus

¹ *Centralbl. f. d. Med. Wissensch.*, 1879, No. 43.

have, as a rule, nothing to do. They are very frequently nothing but the expression of diffuse cerebral pulsations, as one can demonstrate easily in individual cases by laying free the dura. If it is thus produced, and the pulsatory movements of the entire contents of the cranium are communicated to the sinus, it can then make no difference whether it is thrombosed or filled with flowing blood.

Occasionally the external wall of the sinus in extradural abscesses with sinus-phlebitis is not, as it is usually described, very thin and resistant, but is covered with granulations, or more rarely with a thick pad of scarcely detachable pachymeningitic exudate. Under these circumstances in laying bare the dura severe hemorrhage occasionally occurs, the source of which one is liable to attribute to the sinus. The hemorrhage from greatly dilated dural veins or vessels communicating with them (*venæ diploicæ*, Jansen¹) is occasionally quite as abundant as from the sinus itself. Such hemorrhage, however, is to be distinguished from bleeding from the sinus in that it ceases very quickly of its own accord. If the separation of the dura is interrupted, the contents of the cranium press the bleeding venous trunks against the bony wall of the opening, and thus firmly occlude them. The hemorrhage from the *venæ diploicæ* is controlled very quickly by pressure, while in hemorrhage from the sinus the wound must be compressed by a tampon until union of its edges has taken place. Occasionally, difficulty to recognize the sinus from the thickened dura overlying it occurs, particularly in manipulation undertaken for the purpose of examining the contents of the sinus. For this purpose we may choose between two procedures—puncture and aspiration by aid of a syringe, and incision of the sinus. The first proviso for a choice of one of these methods of examination is its lack of danger. At the first glance it might appear as though the exploratory puncture should have the preference in this connection. The experiences on this question in accidental opening of the sinus during the chiselling of the mastoid process render more or less certain the lack of danger of the procedure. Personally

¹ *Arch. f. Ohrenheilk.*, Bd. xxxi., S. 167.

in not a small number of intentional or accidental openings of the sinus I have never seen any immediate ill effects. If it is certain that incised wounds in the sinus usually unite without any alteration in the column of blood flowing through it, any objection, therefore, is wanting which holds that exploratory incision is more dangerous than aspiration. In addition, the blood stream flowing from the normal sinus through the incision would be a protection against the danger of entrance of micro-organisms which could not be so certainly prevented by exploratory puncture. The most essential disadvantage of incision is that, as a rule, the operation must be completed at once, while the slight hemorrhage following the exploratory puncture is stopped by compression, but as exploration of the sinus usually closes the operation this objection can hardly be considered. I cannot, however, in general recommend exploratory incision in place of puncture. As a rule, I puncture first, and if the result is not decisive, conclude by making an exploratory incision. Positive result, that is, the demonstration of pus, is naturally conclusive. In the presence of a firm occlusive plug a negative result would only in that sense be expected that aspiration was impossible owing to the firm nature of the thrombus. *The aspiration of fluid blood from the sinus does not exclude the presence of a thrombus.* The disintegration of the thrombus may have made the passage for the blood stream so free that at the moment of puncture only fluid blood was encountered, and the remains of the thrombus, still clinging to the walls, remain unrecognized. Positive findings, provided naturally that they are composed of disorganized purulent thrombus-masses, and not of material the composition of which is at least doubtful, are absolutely indicative.

Our views on the prognosis of sinus-phlebitis have become essentially broadened under the influence of therapeutic progress. Schwartze has spoken of death as the usual result in sinus-phlebitis, but at the same time has stated that its prognosis is not so absolutely unfavorable as in brain abscess and meningitis. The prospects of a cure in sinus-phlebitis to-day, although they have become perceptibly better for

brain abscess, and even arachnitis cannot be spoken of as absolutely hopeless, are still relatively the most favorable of these three forms of endo-cranial diseases, the consequences of middle-ear suppuration. The prognosis of individual cases depends essentially upon the stage in which treatment is begun. If metastatic foci have not restricted the function of vital organs, it is not absolutely unfavorable. Whether the cure, which in a few exceptional cases occurred spontaneously by obliteration of the sinus, remains permanent, depends on the cure of the fundamental disease, the discharge from the ear. If this is not possible, the opportunity then remains for the origin of thrombo-phlebitis in those blood-vessels which have not been obliterated, as Jansen in fact demonstrated in a patient who, within the space of eight years, was twice attacked with symptoms of sinus-phlebitis and pyæmia. The radical cure of the primary disease localized in the spaces of the middle ear is therefore the first proviso for the persistence of a cure of sinus-phlebitis. The therapy of sinus-phlebitis has made the most surprising progress within the past few years. Even in Pitha-Billroth's *Handbook* Heineke wrote, "The treatment of sinus-thrombosis is out of the question." To-day, literature furnishes so large a number of positive cures that we must conclude that the difficulty in treatment in sinus-phlebitis, as in brain abscess, lies not in the domain of the operation, but almost entirely in that of diagnosis. On this account it is practically correct in doubtful cases to adopt Barker's method of operative diagnosis, and with well-founded suspicion to bare the sinus. In chiselling the mastoid, which in certain cases has resulted in a cure of sinus-phlebitis by emptying the primary purulent deposit, we cease only when the sinus is reached, and if exploration reveals no ground for a suspicion of thrombosis the case may be treated expectantly.

Chiselling of the mastoid is certainly to a degree dangerous in sinus-phlebitis through the jarring communicated to the contents of the skull. If it is possible to produce a transient or even persisting deafness due to commotion of the labyrinth by chiselling sclerosed bone, we must recognize the possibility from the same cause of loosening thrombi

attached to the sinus wall, and thus permitting their entrance into the circulation. Literature contains numerous observations in which the displacement of thrombi was immediately associated with injuries to the head, particularly in cases of operative baring of the sinus.

In spite of this, however, I hold firmly to the opinion to which A. Brieger¹ has given expression, that this main objection does not justify the abandonment of a method which, from the standpoint of simplicity and conformity to the purpose, presents the greatest advantage and which up to the present time is practically indispensable.

The evacuation of extradural abscesses has, like the simple opening of the mastoid, led to a cure in many cases. The following is a case coming under my observation :

A. M., aged twenty-six, discharge from right ear of several years' duration. Severe headache for the past two weeks, first chill occurred four days ago. High degree of œdema between mastoid and back of neck ; *along the anterior border of the sterno-cleido-mastoid hard painful cord ; optic neuritis.* Temperature, 40.1° C. Operation the day following admission. Cortex thin ; abscess cavity filled with cholesteatomatous masses and communicating with a large perisinuous collection of pus by a small fistula. Sinus pulsating. Defect in posterior wall of meatus. Temperature curve marked by remissions to 39°, 38°, and 37.4° C., and rapid rises to 39° and 40° C. Chills frequent, the last occurring on the thirteenth day after operation. Gradual decline of the optic neuritis. Pulse remained permanently above 100. Patient discharged cured two months later.

As far as it is possible to diagnose sinus-phlebitis clinically, it was justified in this case.

The possibility of a cure of sinus-thrombosis by clearing out the primary pus collection and evacuating the pus which bathes the sinus, seems to me from this experience to be undoubted. The statement of Bergmann in his work on the surgical treatment of brain disease, that thrombosis of the lateral sinus is freed from its dangerous character by removal of the pus in contact with its walls, is completely sub-

¹ *Archiv f. Ohrenheilk.*, Bd. xxxv., S. 89.

stantiated by my experience. If the production of fresh excitants ceases, the organization of the thrombosis can proceed unhindered, provided no extensive disintegration has occurred. In this fact lies an earnest warning to refrain from too energetic procedures without unquestioned indications.

When thrombosis has been demonstrated, the manipulations consist of wide opening by excision of the wall and evacuation of the contents of the sinus. The danger of entrance of air into the vessels of the brain, formerly so greatly feared, does not seem to exist in perceptible degree. The rarity of inspiration of air is attributed usually to the rigidity and immobility of the vessels. The essential fact is, however, that in the cerebral vessels a positive pressure exists, not as in the jugular vein a weak negative.

If complete disintegration of the thrombus exists with firm central occlusion, and that portion which is opened is filled with pus and thrombus-masses, the evacuation of the pus by incision may lead to a cure without anything further. More difficult to explain are the favorable effects in cases with the clinical symptoms of sinus-phlebitis in which the operation has not disclosed a thrombus. Here is a case in point:

D. L., aged fifty-two. Attacked with influenza six weeks prior to admission. Pain in right ear commenced some days later. No discharge. Repeated chills. Four days before admission swelling in vicinity of right ear. Temperature normal; fundus oculi normal. Diffuse œdema of tissues back of ear extending to neck, also in front of ear. Drumhead bulging and reddish-yellow in color. Prolapse of posterior and upper wall of meatus. Total facial paralysis of right side.

After removal of the almost sclerotic cortex a cavity was encountered, filled with tenacious yellow pus, communicating posteriorly with a widespread perisinuous pus collection. In addition a communication existed with a gravitation abscess at the lower anterior border of the mastoid process. Fistulous perforation at the incisura.

Pressure on the swelling back of the mastoid evacuated more pus from the abscess surrounding the sinus. The entire descend-

ing crus of the sinus was bared and its wall found covered with granulations. On the twenty-second day a chill occurred which was repeated the following day. Rapid rise in temperature to 40° C.

Sinus again exposed. Pulsation plainly visible. Small amount of fluid blood removed by aspiration. Incision also gave exit to but little blood. On this account the descending limb of the sinus was split almost in its entire length. Copious hemorrhage, pulsating in character, necessitated tamponing. Chill in the evening, with rapid rise of temperature to 39.6° C. Progressive improvement from this time on, ending in recovery. Bacteriological examination of blood from median vein as well as from sinus resulted negatively.

Here the diagnosis of sinus-phlebitis was not rendered certain. It was, however, made upon a better foundation than many others which have been described as sinus-phlebitis solely through the onset of a pyæmic form of fever. The coincidence of the subsiding of the fever with the opening of the sinus may naturally be considered as accidental, but the assumption of a causal connection between both processes appears to me to be more plausible than that the chills should have come to an end upon the day of the operation.

Just what course should be taken in simple thrombosis after opening of the sinus in cases where purulent softening of the thrombus is not apparent at the point of incision, is at the present time undecided. Hessler opposes in such cases the opening of the sinus in order to prevent a possibility of infection if puncture has shown simple thrombosis to exist. If, after opening the sinus, one is certain of the presence of a solid obstructing thrombus, the removal of the mass may be deferred and its possible organization waited for. It is impossible to lay down general principles for the procedures which one may adopt in a case of simple thrombosis. To adopt an expectant plan in general until such time as a return of pyæmic symptoms forces one to clean out the sinus, would be a mistake.

The method of exposing the sinus has of late been so frequently treated in an exhaustive manner that I may omit its

description. The sinus must be sought for in the same direction in which the pus from the cavity of the mastoid has proceeded. All the measurements and statements relative to the location of the sinus or its individual segments to different points on the external surface of the cranium, as Koerner has already explained, are unreliable and useless.

Injuries of the inferior vertical semicircular canal may produce no symptoms, or these may be concealed by the severity of the general symptoms. In one of my cases severe giddiness occurred, which came on with the slightest lifting of the head from the horizontal position, and particularly in turning the head in the direction of the affected ear. Three days later the condition was greatly improved.

The results in cases operated upon by me are as follows: The total number of cases observed was fourteen; of these six were observed at a time when operative treatment was not generally approved of. In two, sinus-phlebitis was not recognized during life. All of the six, in spite of chiselling the mastoid, ended fatally. In the remaining eight which were operated upon, three were treated by the evacuation of extra-dural abscesses, of which two were cured; one died from pyæmia and meningitis. Three cases were treated by measures directed to the sinus. One was cured, two died from pyæmia.

Concerning the changes which take place in the open sinus after clearing out the thrombus-masses, and the manner of healing in sinus-phlebitis treated by operation, we have, up to the present time, no exact description. As a rule, cases operated upon have not remained under observation long enough after operation, but have died before changes in the sinus could have become organized. By the ligation of the jugular the most important action expected is the prevention of the transportation of thrombus particles to the heart. But granted that the absolute occlusion of the principal path to the heart may not prevent the carrying of emboli on account of the number of collateral vessels, Forsselles¹ is right in his statement that it is at all events better to have one rather than two paths for infection. In describ-

¹ *Lateralsinus-Thrombose*, S. 36.

ing the difficulties which the slight power of distension of the emissary veins affords for the development of collateral circulation, Zaufal¹ has pointed out the fact that in suddenly occluding the path by thrombosing the sinus the extra amount of blood is driven less into the emissaries than into the meningeal and cerebral veins. A similar effect seemed to have been produced in a previously reported case by ligation of the jugular, in that, with the blood, pyogenic substances or particles of the thrombus were pressed into the veins upon the surface of the brain, so that these appeared like strands of pus. In addition, the thrombophlebitis was transferred through the emissaries to almost all the cerebral sinuses, and finally to the jugular of the opposite side. In addition, extensive pulmonary metastases and multiple pyæmic cerebral abscesses were found. I cannot blind myself to the view that the occlusion of the jugular, corresponding to the thrombosed lateral sinus, did not only fail to prevent the exit of particles of the thrombus, but really favored the unusually widespread thrombo-phlebitis, which apparently took place in all possible directions.

It is certainly conceivable that this occlusion of the path of exit might possibly have had fewer questionable results if the thrombo-phlebitis had been reached at the first operation in its entire extent, and the danger of a backward flow in the adjacent venous area diminished by wide opening or excision of the jugular cord. *Ligation of the jugular is then only unquestionably justified when it is locally indicated*, that is, if a thrombo-phlebitis of the jugular bulb or of the vein itself exists, but then less as a means of cutting off the phlebitic focus from the blood stream than as the first act of therapeutic measures directed against the thrombosis.

In opposition to Koerner I do not believe ligation of the jugular in sinus-phlebitis to be devoid of danger. The danger of emboli in such a sudden and rapid occlusion of the vein, the points of origin of which may still in great part be free, is greater than in the gradual, slowly-developing occlusion which arises by thrombosis or consecutive obliteration.

¹ *Wiener med. Wochenschr.*, 1886, No. 41.

tion. The centripetal flow at the point of ligation undergoes reversal of its stream, whereby naturally any thrombi clinging to the walls are torn loose and may be carried in a centrifugal direction. In this way we may explain the origin of discontinuous thrombi, which are separated from one another by a normal venous area, and above all the genesis of multiple metastatic cerebral abscesses.

Of first importance, however, is the danger that ligation of the jugular may produce thrombosis of the blood columns in that venous area excluded by ligature and sinus-thrombosis. Stasis of the mass of blood within a vessel is not in itself sufficient to cause coagulation. A proviso for its origin is the presence of an alteration of the vessel wall. How in slight and imperceptible changes in the vessel wall the blood column may coagulate over a wide expanse is shown in a case published by Wendt,¹ in which compression of the jugular by a glandular tumor in the neck caused almost complete thrombosis of the corresponding lateral sinus. An alteration of the vessel wall may be sufficient for the thrombosing of the stagnant mass of blood, which would be immaterial for blood travelling at its normal rate (Eberth und Schimmelbusch).²

In circulating blood its bactericidal power may exert itself by destruction of, or by restraining the development of pyogenic organisms which have gained access to it. A thrombus, on the contrary, is rapidly attacked by micro-organisms, for which it furnishes favorable conditions for growth, the consequences of which, under certain circumstances, may be a progressive thrombo-phlebitis. This assumption has been substantiated by the observations of Lane, Deansley,³ and Langenbuch.⁴ Pyæmia and sinus-phlebitis ending fatally were the results of operations on the normal sinus and jugular. Langenbuch expressed the opinion that in his case a sinus-thrombosis first formed after the operation, but thanks to the ligation of the jugular no large metastases took place. In this case, which

¹ *Arch. d. Heilk.*, Bd. xi., S. 593.

² *Fortschr. der Medicin*, 1886, No. 4.

³ *British Med. Journ.*, 1895, p. 803.

⁴ *Berl. klin. Wochenschr.*, 1895.

ended in recovery, both the sinus and the jugular were found normal at the operation, but in spite of ligature of the jugular, metastases formed a number of weeks later which were wanting prior to that time. It is difficult to understand how in this form of pyæmia, in which a direct spread of micro-organisms in the circulation without the assistance of large embolizing masses takes place, ligation of the jugular could have been adopted, when we are aware of the large number of venous paths in the temporal bone which in themselves render this procedure useless. With only a suspicion of sinus-phlebitis, to begin with ligation of the jugular is an error. In my opinion it is more proper to commence at that point where the disease process is supposed to exist, instead of adopting a prophylactic operation against a danger which possibly does not exist.

The possibility of direct precipitation into the blood-stream of portions of a sinus-thrombus by manipulation of the sinus itself, without previous ligation of the jugular, appears, as Koerner shows, to be deduced theoretically rather than to exist practically. It appears more probable that the sinus is usually closed towards the heart by a sufficiently solid thrombus.

If it is impossible to define the limits of the thrombus when exposed as much as possible, or if its decomposition extends into the horizontal portion of the sinus so that its occlusion by a solid plug is but slightly probable, or if the course after the operation permits the assumption of the loosening of this occlusion and the centripetal extension of the thrombus, ligation of the jugular is justified. More than that, it is necessary if the thrombosis has already extended into the jugular itself.

Ligation of the jugular, therefore, must be locally indicated. It should not be undertaken solely as a prophylactic measure directed against general pyæmic infections. For the purpose of cutting off the thrombosis from the circulation, ligation of the jugular does not suffice. If it is desired to practically isolate the thrombosed area (which on account of the impossibility of excluding all its connections is out of the question), it is necessary to occlude it at both of the

principal points of its origin and to ligate not only the jugular but the torcular as well as was first proposed by Horsley. Ducellier speaks of Chipault's operation as one which appears practical but which has never been tried: the first act of which is the double ligature of the internal jugular with section of the vein and fixation of its peripheral end in the wound; the second act, the ligature of the transverse sinus close to the torcular and its occlusion; and lastly, the opening of the sinus, with resection of the wound and sinus and jugular drainage. Statistics appear to speak for the utility of ligation of the jugular. The percentage of cures in combined opening of the sinus and ligature of the vein, according to Koerner, exceeds those of exclusive operations on the sinus perceptibly. Statistics, however, on this question are not decisive in themselves. For one thing, as we have previously stated, cases are included in which the presence of sinus-thrombosis was not completely demonstrated. In addition, the various cases differ so much and were operated upon at such varying stages of the disease, and the cure in exceptional instances was so largely dependent upon other factors than the operation itself, that the fact that the number of cures from ligature of the jugular being the greater does not alone speak for the greater worth of the combined method. Statistics based upon a greater amount of unquestionable material will perhaps show an increased percentage of relative cures. On this account it appears to me that at the present stage of the question the standpoint is not unjustified that the statistics derived from the individual results obtained by observers having access to a relatively great amount of material is worthy of more attention than that derived from an accumulation of the published results of various authors. Schwartz, Jansen, and Macewen, however, have thrown aside ligature of the jugular in sinus-phlebitis, basing their actions on observations derived from the large amount of material at their command.

Our case, in which it was difficult even at the autopsy to find the vein and to follow its course, points to the technical difficulties which may lie in the way of its ligation. One cannot be guided by the evidence of swollen glands

which usually may be expected to lie at the outer side of the sheath and above the jugular. In the case already referred to, following the swollen glands in the area selected for ligation would have led us directly to the carotid. In cases in which one has a choice in the matter, in those in which the vein is still free from thrombosis it is better to follow the direction of Von Bergmann and tie the internal jugular above the point of entrance of the facial. A proviso for carrying out this procedure is naturally the direct emptying of the facial vein into the internal jugular. How low down it is necessary to go in thrombosis of the vein itself depends, of course, upon the extent of the thrombo-phlebitis. By progressive compression downwards indications may be obtained of the point where permeability begins. Lesions of the carotid have never been observed in ligation of the jugular, and are scarcely possible, as in division of the sheath the vein may be isolated without any displacement of the carotid. In ligation of the carotid, phlebitis of the jugular, by irritation of the ligature, and erosion of the vein wall with hemorrhage have been observed by Von Nussbaum. The most available point for ligating the jugular appears to be the carotid triangle above the anterior belly of the omo-hyoid muscle. The previously mentioned experiences permit, in my opinion, the following conclusions for deciding the necessity and utility of ligation of the jugular in sinus-phlebitis. **The systematic application of ligation as an integral part of the operative therapy of sinus-phlebitis is not justified. It is an error in pyæmia without sinus-phlebitis. A proviso for its application is the positive demonstration of sinus-thrombosis by examination of the contents of the sinus.** In the presence of a solid occlusion in the direction of the jugular vein, if evidence is wanting for the assumption of the extension of the thrombosis into the vein, ligature is superfluous and under certain circumstances injurious. In addition, dependence on the general condition after the sinus has been opened as a guide for ligation of the jugular, as Jansen proposes, is questionable.

The principal point, in my opinion, in deciding as to whether or no the vein should be ligated, is dependent

upon the local findings in the vein itself, or at least at the central end of the thrombus.

Definite directions relative to the time at which one is justified in operating, the earliest date, and how long it may be postponed, cannot be given. The sole contra-indication for the operation aside from the natural consideration of the condition of the heart, etc., I believe to be purulent lepto-meningitis, the presence of which is to be demonstrated not only by the diffuse meningeal symptoms, which under certain circumstances accompany sinus-thrombosis, but most certainly by *spinal puncture*. Metastases, particularly of the lungs, do not exclude the carrying out of this operation, as Voss, Schmiegelow, and others have justly emphasized.

The question of what proviso must exist, what symptoms must be present, scarcely permits of discussion at the present time. An absolute clinical diagnosis, which it was formerly necessary to make from a demonstration of metastatic foci, is not at present so unquestionably necessary for the exposure of the sinus as formerly. With the possibility of directly recognizing thrombosis from the sinus itself, that is, by the application of exploratory operations, we are placed in a position to operate much earlier and with a greater prospect of success.

III.—THROMBOSIS OF THE CAVERNOUS SINUS.

Isolated thrombosis of the cavernous sinus requires, according to its pathogenesis, as also from its symptomatology, a special classification in contradistinction to analogous diseases of the other blood-vessels. Participation of the sinus cavernosus in a thrombosis spreading from the lateral sinus by way of the petrosal, is by far more frequent than exclusive disease of one or both of the cavernous sinuses. A general understanding of the genesis of this latter form has been particularly furthered by Koerner,¹ who pointed out the importance of the carotid canal in conveying suppuration to the cavernous sinuses and to the meninges. Among three cases of isolated thrombosis of the cavernous sinus observed

¹ *Zeitschr. f. Ohrenheilk.*, Bd. xxiii., S. 230.

by myself, in two the correctness of the diagnosis was substantiated by autopsy. In the third case the clinical evidences were so pronounced that any other explanation was scarcely possible. One of the cases given has already been published in the dissertation of A. Brieger. In this case both cavernosi were filled with pus, in addition to fresh coagula in both lateral sinuses and in the longitudinal sinus. The second case came under observation in an almost moribund condition.

K. M., aged fourteen. Marked fluctuating swelling back of the left ear; œdema of the brow and both eyelids; chemosis of the left conjunctiva; left eye very prominent, apparently immovable; pupils wide, not reacting to light; anæsthesia and total paralysis of the left half of the face; meatus filled with fetid pus; *anterior* and upper wall almost completely prolapsed.

Operation, June 10th.—Wide fistulous opening through cortex; mastoid walls and antrum filled with yellowish cheesy masses and flabby granulations. After scraping out the granulations a wide defect was found in the sigmoid sulcus, which after removal of its carious edges measured 4 *cm* in diameter. Sinus wall discolored, thickened, covered with granulations; weak cerebral pulsation; incision of the sinus evacuated fluid blood. In enlarging the incision upward, violent hemorrhage occurred, necessitating an immediate tamponade. In continuing the operation an extensive pus collection was exposed in the squamous portion of the temporal bone extending from above the root of the zygoma to the anterior wall of the meatus. Some forty minutes later the operation was discontinued, owing to weak heart action. The day following the operation the temperature was normal. The œdema of the lid and chemosis of the left eye perceptibly diminished. Ptosis, on the contrary, remained unchanged. October 10th, protrusion of the eye perceptible to a slight degree only; globe more movable; fundus normal. Death at 10.30.

Autopsy.—The left sigmoid sinus contains a large thrombus, non-adherent to the sinus wall; both the petrosal and left cavernous sinuses were empty; in the right cavernous sinus, however, a brownish-red thrombus was found firmly adherent to the walls. Further examination showed the sigmoid sulcus and the squamous portion of the temporal bone perforated; anterior and posterior surfaces of the pyramid unchanged; in the tympanum a large

amount of cheesy material ; malleus and incus wanting ; carious perforation on the floor of the jugular fossa. The medial wall of the osseous portion of the tube showed an irregularly shaped perforation, communicating with the carotid canal, in which similar masses to those in the tympanum were found.

The assumption of osseous tuberculosis, unquestionably justified both clinically and anatomically, was substantiated by the demonstration of tubercle bacilli in the cheesy masses removed from the tympanum. A thrombus was found only in the right cavernous sinus, although the clinical symptoms pointed mainly to an occlusion of the left. The clinical symptoms of this case correspond completely with the classical picture of thrombosis of the cavernous sinus. Exophthalmus, paralysis of the ocular muscles, immobility of the globe, œdema of the lids, chemosis of the conjunctiva,—in short, all those symptoms which may be met with alone or in various combinations,—were present here almost without exception.

Paralyses of the ocular muscles in sinus-phlebitis are frequently, perhaps generally, not caused directly by such phlebitis, but rather by the complicating meningitis. In uncomplicated thrombosis of the cavernous sinus also, they can scarcely be caused mechanically, as it is scarcely possible that the adjacent nerves could be compressed by the thrombus mass. It is more probable, as Robin assumes, that these paralyses arise, not through thrombosis, but rather through the phlebitis, the latter producing a neuritis. Changes in the background of the eye may be wanting in thrombosis of the cavernous sinus. In all three cases under my observation symptoms of stasis, if not of choked disc, existed. We must confess that no one of the many symptoms of thrombosis of the cavernous sinus, which have been designated as pathognomonic, is sufficiently indicative in itself alone to justify the diagnosis. In cases where thromboses originate quickly and without other complications, as in injuries, a more or less complete combination of all these symptoms is met with. The above case shows an unusually complete combination of all the characteristic symptoms. The assumption, therefore, seems to me justified that a

thrombosis of the left cavernous sinus, as well as of the right, had taken place, but after the operation, as shown by the subsidence of the symptoms of stasis in the area of the ophthalmic vein, the sinus had again become permeable. The same conclusion was arrived at in the following case :

B. K. ; age, twenty-two. Discharge from left ear ; large perforation with circumscribed caries of the labyrinth wall of the tympanum ; nine days later, slight swelling of the upper and lower lids of the left eye ; in the evening, marked chemosis of the conjunctiva ; perceptible protrusion of the globe ; on the following day, in addition to the œdema of the lids and chemosis, a small hemorrhage in the chemotic conjunctiva, paralysis of the abducens, hyperæmia of the left papilla, and marked congestion of the retinal veins. Operation three days later. At a depth of $3\frac{1}{2}$ cm the lateral sinus was reached, which presented a grayish-blue, prominent, pulsating tumor. Incision was followed by copious hemorrhage, which was controlled by pressure, in order that the operation might be continued. Antrum, small without change. The day following the operation, the symptoms of stasis in the area of the ophthalmic vein, œdema of the lids and chemosis, as well as the protrusion of the globe, had almost entirely disappeared. Two days later, findings were normal. Rapid recovery. Patient discharged cured on the 21st of April.

The diagnosis of sinus-thrombosis in this case after what has been said above scarcely permits of a more exact foundation. In addition to the well-known symptoms which were here united in almost scholastic combination, another condition existed, to the presence of which in thrombosis of the cavernous sinus Ziem¹ has called attention. This was the appearance of hemorrhages in the chemotic conjunctiva. In both cases pronounced and rapid recession of the symptoms of stasis in the area of the ophthalmic sinus followed the opening of the lateral sinus. This recession was so sudden in the two cases that all precautions in drawing conclusions could not obviate a causal connection between it and the operation.

I have given above quite thoroughly the grounds which

¹ *Wiener klin. Wochenschr.*, 1892, S. 379.

led me to assume in the first case, although the autopsy did not demonstrate it, thrombosis of the left cavernous sinus. This assumption is also supported by the demonstration of an adherent thrombus in the right cavernous sinus. Its origin might possibly also have been due to tuberculosis of the body of the sphenoid and thrombosis of the basilar sinus. Such isolated thrombosis of a single sinus on the opposite side to that corresponding to the disease is not a novelty. Jansen found in one of his cases an isolated thrombosis of the opposite inferior petrosal sinus as the point of origin of pyæmia and its explanation in an arachnitis transferred from the labyrinth of the diseased side. Another explanation applies to cases in which, in spite of characteristic clinical symptoms, the supposed thrombosed sinus is found pervious at the autopsy. The possibility must always be considered that during the autopsy a sinus may be washed out and appear macroscopically unchanged, although during life it was occluded. Thrombo-phlebitis is anatomically so passing and relatively rapidly changing a condition that a mistake between the anatomical findings and the clinical picture may easily take place. But even if in the former case the thrombosis of the right cavernous sinus did not originate by progression from the other side, but took place idiopathically, the fact that the symptoms of stasis upon the side where the thrombosis was demonstrated were essentially less than on the side where the vessel was found free, points to the fact that here had originated the most powerful cause for the origin of these symptoms. To this is to be added the demonstration of the thrombus in the left lateral sinus, which by incision and exploratory puncture was not found thrombosed. Here we were not concerned with a stratified thrombus in the usual sense, but rather with a centrally-decolorized homogeneous thrombus-nucleus, which was surrounded by a dark-red recent thrombus. More exact examination, unfortunately, was omitted. It appears to me to be not excluded that the nucleus of this thrombosis originated from the cavernous sinus, and gained access to the lateral sinus by way of the superior petrosal, where, in consequence of the interruption of the blood-stream set up

by tamponing the sinus, it was enclosed by this fresh thrombosis. It is possible that a thrombosis of the sinus cavernosus obstructing the flow from the ophthalmic sinus may have become loosened under the influence of opening the lateral sinus and, aided by the hemorrhage which ensued, was either thrown out or gained entrance into the circulation. That no manifest metastatic processes were excited thereby does not exclude this assumption. Embolic collections in cases of non-infectious thrombi may undergo rapid absorption without producing any clinical symptoms.

It is questionable whether it is possible for the opening of the transverse sinus to produce such an effect as I have here assumed. In general, this possibility, in my opinion, cannot be questioned. It has been previously stated that the blood pressure within the vascular system is sufficiently high, as a rule, to exclude aspiration of air when a sinus is opened. Positive statements relative to the height of the blood pressure in the venous spaces of the cranium are only in accord with this fact that the difference between the arterial and venous pressures is altogether different from that in other portions of the body. Of late Hill and Bayliss¹ have directly measured the pressure in the torcular and found that under physiological relations the pressure in the venous sinuses is in general similar to that within the cranium generally. From the height of the blood-pressure in the cerebral sinuses an explanation is found for the fact that when they are opened not only does no aspiration of air take place but on the contrary hemorrhage occurs often with the same force as from an artery. It does not seem impossible to me that, in such sinus hemorrhage if the venous blood flows with increased rapidity to the point of less pressure, coagula which are but loosely adherent to the walls of the cavernous sinus may be torn away and gain access to the lateral sinus by way of the superior petrosal. Whether this took place in both of my cases when the lateral sinus was opened is, of course, uncertain. It only occurred to me to point out the theoretic possibility of such an occurrence. The coincidence that the disappearance of the symptoms of thrombosis at the time of

¹ *Journal of Physiology*, vol. xviii., No. 4.

the operation was purely accidental is, in addition, opposed by the extraordinary rarity of spontaneous absorption of a thrombosis of the cavernous sinus.

Such occasional occurrences do not in the least alter the unfavorable prognosis. Operative treatment has up to the present time been followed by success in but one instance by Bircher.¹ In this case the entire pyramid was loosened from its connections. In isolated thrombo-phlebitis of the cavernous sinus Hessler² has recommended the method of operation proposed by Krause³ for the intracranial resection of the trigeminus as applicable for finding the sinus. Before the appearance of Hessler's book I had already tried this method on the injected cadaver and become convinced that the practical application of this procedure was very questionable and offered but few chances for success. The sinus has been repeatedly reached and injured, by Krause, Finney, and Czerny in trigeminus resection. My experiences permit at least one practical deduction: Exposing the lateral sinus in the cases in question, in which usually there is a suspicion of simultaneous thrombosis of the transverse sinus, is indicated mostly for diagnostic purposes. But once the sinus has been exposed, it is advisable to incise it with sufficient precautions. Further experience may produce a broader foundation for judging my hypothesis of the action of opening the lateral sinus upon thrombosis of the respective cavernous sinus.

¹ *Wiener Naturforscherversamml.*, 1894.

² *Arch. f. Ohrenheilk.*, Bd. xxxviii., S. 16.

³ *Verhandl. der deutsch. Gesellsch. für Chir.*, 1895.

A CASE OF PYÆMIA AFTER ACUTE SUPPURATION OF THE EAR: OPERATION; RECOVERY.

BY DR. F. RÖPKE, SOLINGEN, GY.

Translated by Dr. A. N. ALLING, New Haven.

Mrs. Sch., twenty-six years old, of healthy family, never previously ill, contracted a severe cold on March 1st, of this year. On the following night she had violent pain in the left ear, and on the next day pus came from the left ear.

The family physician ordered chamomile tea, syringing, and poultices. Yet the suppuration continued to increase.

On March 11th, by advice of the physician, she came to my clinic. She complained of sleeplessness, loss of appetite, lassitude, throbbing in the left ear, and pain in the left temple and back of the head. The left auditory canal, which was full of thick, green pus, after careful cleansing, was open in its whole extent. The drum membrane was deeply congested; posteriorly markedly swollen; anteriorly in the lower quadrant a small perforation, out of which pulsating pus was flowing. The mastoid process was not swollen; only at the apex was it somewhat sensitive to pressure. Temperature, 37.6° ; pulse, 100. The perforation in the drum was enlarged; the canal was loosely packed with gauze up to the perforation, and ice compresses on the mastoid were ordered.

The patient came daily with subjective and objective symptoms unchanged.

On March 17th she remained away and did not come again until the 20th. She said that during this time she had felt so weak and had been so feverish that she was unable to come. The ear was suppurating freely; she had had, however, no pain in the ear,

but felt stupid, sometimes dizzy; had nearly constant pain in the left temple. She looked completely changed and gave the impression of being very sick. The canal was patent. The opening in the drum membrane was sufficiently large for the free flow of pus. The mastoid and region behind it were not swollen. Percussion of the skull showed tenderness only at the tip of the mastoid. The neck was freely movable; no swelling in any glands of the neck. No cord in the region of the jugular could be felt. Pupils were of equal size; tongue was dry and cracked; percussion over the lung everywhere normal; everywhere vesicular breathing; heart and liver normal; spleen *not* enlarged; no albumen in urine; temperature, 38.2° ; pulse, 110.

Transfer to hospital advised. On the afternoon of the 22d the patient was admitted. She had had a chill on the evening before but felt better again in the morning. Temperature after admission, 39° ; pulse, 116.

March 23d.—Chill, 8 o'clock in the morning; temperature, 40.4° ; 2 o'clock in the afternoon, 37.2° ; in the evening, 10 o'clock, chill, temperature, 40° ; pulse, also in the interval, 116–120. The examination of the other organs now showed *enlargement of the spleen*. Slight diarrhoea to-day. Chiselling was refused.

March 24th.—Morning temperature, 36.8° ; 6 o'clock, evening, chill, half-hour duration, temperature 41.6° ; later, copious sweating. 11 o'clock, evening, temperature, 39.2° ; pulse, 120–124.

March 25th.—Patient slept some toward morning, but felt very languid. Temperature, 36.9° . She gave consent to operation. 12 o'clock noon, temperature, 38.7° ; pulse, 112. Repeated careful examinations showed tenderness only at the tip of the mastoid; nowhere swelling. Unfortunately the background of the eye was not examined.

Operation.—Incision parallel to the insertion of the auricle (from 1 cm above the linea temporalis to the apex of the mastoid). Second incision at right angles backward from the middle point of the first. After elevating the periosteum, copious bleeding occurred from the veins in the bone back of the canal. A little pus oozed out of the dilated emissary mastoid vein. Yet with a probe one could feel, farther in, a solid thrombus. The first stroke of the chisel over the usual site for opening into the antrum exposed a cavity which was filled with thick pus and granulations. Probing showed that the cavity extended backward to the region

of the lateral sinus, below to the apex of the mastoid. The thin, necrosed bony covering was chiselled away as far as it extended, and the granulations were carefully scraped out. After the bleeding was stopped by pressure of a tampon and the cavity could be examined, the vertical part of the lateral sinus was seen to lie exposed on the posterior wall. The wall of the sinus, which was not changed and did not pulsate, was punctured, but neither blood nor pus were aspirated. From the opening of the sinus it was evident that we had to deal with a solid thrombus. Tampon in the wound cavity. Bandage.

During the narcosis the pulse went back to 86-90, two hours after the operation it was again 100. Temperature, 35.4°; 8 o'clock in the evening, 36.8°.

March 26th.—A chill at mid-day; temperature, 39.8°; pulse, 136; dressing changed; wall of sinus was unaltered; recumbent position strictly enforced.

On the following day at noon slight rise of temperature to 38.4°, from March 30th, normal temperature, pulse still rapid. Daily change of dressing, wound always showed fresh, healthy, granulations. The ear did not discharge again. The spleen on the seventh day after the operation could not be felt. On the tenth day the patient got out of bed for the first time, on April 10th she left the hospital, and on April 30th she was discharged, cured. Whispering voice could be heard with left ear at the distance of five metres.

REMARKS.

After the patient was taken to the hospital and was there carefully watched, it was easy to determine that we had to deal with otic pyæmia. The chill, the sudden rise of temperature to 41.6°, then the equally rapid fall to the normal, the rapid pulse which also remained at the same height during the intervals, the tumor of the spleen, the dry, cracked, thickly coated tongue, all supported the diagnosis. Further, I held that we had to do with pyæmia from an osteo-phlebitis. The pyæmia could arise from the seat of disease in the middle ear and in the mastoid process. That, besides the middle-ear suppuration, there was surely suppuration of the cells of the mastoid and probably also acute necrosis of the bones, was evidenced by the profuse discharge from the

ear and the tenderness of the mastoid to pressure. No outward symptoms of sinus-phlebitis were present. There was no œdema in the region of the temple, also none at the posterior border of the mastoid. There was no cord to be felt in the jugular region, and also other well recognized symptoms were wanting. After pyæmia was diagnosed there was but one treatment, opening and cleaning out the supposed primary seat of the disease.

The operation showed thrombosis and partial suppuration of the mastoid emissary, suppuration of the mastoid cells, and necrosis of the bone up to the still healthy sinus wall; thrombosis of the lateral sinus.

Although the sinus was found thrombosed, I incline to the opinion that the origin of the pyæmia was independent of the thrombus of the sinus. I hold that the infection from the seat of suppuration was propagated through the veins of the bone. The thrombus of the sinus probably originally occurred by extension through the mastoid emissary, while the sinus might have been infected directly from the adjacent seat of suppuration, yet the sinus wall would probably then not have been healthy and the thrombus would have completely broken down into pus.

The subsequent favorable course of the disease also corroborates the view that the pyæmia occurred from an osteophlebitis, for after the clearing out of the primary seat of the disease only one chill occurred. The temperature, however, only rose to 39.8° and, moreover, no metastases were observed.

ON THE SPONTANEOUS RECOVERY OF CHOLESTEATOMA AND CHOLESTEATOID AFFECTIONS IN THE TEMPORAL BONE.

BY DR. KONRAD REDMER, OF DANZIG, GERMANY.

Translated by Dr. J. A. SPALDING, Portland, Maine.

THERE are suppurations in the temporal bone and tympanum which are spontaneously cured by the morbid product being expelled along the natural channel, the external auditory meatus, leaving behind them in the bone, as the result of erosion, caries, or necrosis, peculiarly shaped cavities, which ultimately become covered with epidermis. All of the cavities bear a great resemblance to one another, and Zaufal is right in asserting that they look precisely like those which we artificially produce by modern operations for chronic suppuration of the middle ear and temporal bone.

Such cases, now, ought to be collected and investigated, because we have the right to assume that a more accurate knowledge of spontaneous cures may be of great value in developing our operative methods. For there can be no doubt that the most perfect methods in surgery are those which most accurately imitate nature's cures.

Four cases of spontaneous recovery having fallen under our care or observation, we feel inclined to publish them, though they really are not so rare as might seem, owing to the scanty literature bearing upon the subject. So far we have found none that exactly resemble our own cases, though the trouble may lie in the difficulty of accurately de-

scribing similar cases so as to make them clear to others. But this difficulty may now be said to be conquered, after reading recent and detailed accounts of the appearances observed after the operations which go by the name of Zaufal and Stacke. So then from reading of these which leave an opening resembling those observed in the spontaneous cures, we can get an accurate idea of the latter.

For example, every aurist knows what we mean when we speak of transforming, by means of an operation, the meatus, tympanum, and mastoid-antrum into a large single cavity. Now the absence of any such suggestive picture made it very difficult for the early aural specialists to describe the appearances of such a case, and so prevent us from understanding now, from their descriptions, whether the cases that they saw belong to the same class or not.

It would seem as if spontaneous cures were almost always due to the erosion of "*cholesteatomata*," which are finally spontaneously extruded through the natural passage, the external meatus. But the great diversity of opinion now existing over the whole question of what these tumors actually are, hinders any definite and clear decision.

The greatest obstacle to unity lies here. What is a cholesteatoma, and where does it originate?

The long-standing discussion of this point between pathologists and aural surgeons leaves both parties still in the right. For there are cholesteatomata in the ear and temporal bone which in the sense of the pathologists coincide with those discovered in other bones of the skull, as well as in the brain, meninges, mammary glands, ovaries, and testicles. These tumors are undoubtedly true tumors, not homologous, but actually heterologous in the sense in which Virchow uses that term.

Kuhn, for instance, has seen cholesteatomata which were actual tumors, and had nothing whatever to do with chronic suppuration from the middle ear. He has seen them where the *Mt* and meatus were absolutely normal, and again after a suppuration of so short a period that the discharge could not, by any human calculation, have anything whatsoever to do with the neoplasm.

Again, on the contrary, we see numerous cases of cholesteatoma in the middle-ear spaces secondary to suppuration.

Habermann and Bezold assert that the epidermis of the perforated *Mt*, or of the meatus, proliferates into the bony cavities of the middle ear, and that whilst the inflammation persists we have an over-production of epidermis, and, as a secondary result, the formation of cholesteatoma. It is only when they come to the etiology of the perforation in the *Mt* that these authors differ—Habermann declaring that a middle-ear suppuration has made its way out into the meatus, whilst Bezold refers the trouble to frequent catarrhal obstructions of the tube, as a result of which Shrapnell's membrane is pressed inward against Prussak's space, and so united with the adjacent tissues.

Leaving now aside the possibilities of the manner in which cholesteatoma originates, we may refer to Leutert's discovery in suppurating ears of epithelial cysts which histologically resemble the traumatic epithelial cysts of the skin, but in the ear, macroscopically, resemble cholesteatoma. If now these epithelial cysts are found in the ear, Leutert calls them cholesteatoma.

As it is therefore plain that entirely different sorts of "cholesteatomata" originate in the ear, it is incomprehensible how in otological literature all these things are still labelled with the same name. By cholesteatoma in the ear we understand (and we cannot understand anything else) that which pathological anatomy in other parts of the body calls by that name (in Virchow's sense of heterologous tumors); in other words, cases such as Kuhn has described. All other secondary accumulations of epidermis should never be entitled "cholesteatoma," but, according to their genuine nature, "retention masses, resembling cholesteatoma," or "hyperplastic epidermis," or "epithelial cysts."

Practically, the difficulty in keeping to this distinction is great, because so many similar productions have the same final effect. But at the post-mortem table it is easy to recognize a genuine cholesteatoma when we find it in the temporal bone without suppuration in the tympanum or perforation of the *Mt*. When, however, a genuine cholesteatoma has become infected by an accidentally simultaneous suppuration, and in its turn now maintains that suppuration, the

anatomical differentiation, and still more the clinical, from hyperplasia of the epidermis becomes difficult or indeed impossible. Often we see cases described in which it is doubtful whether the cholesteatoma is to be regarded from Virchow's point of view, or from that of Habermann or Bezold. Sometimes we cannot suppress the suspicion that the so-called cholesteatoma is nothing but thickened and caseous pus in the antrum and adjacent cavities.

Thus, for instance, the antrum in children is often filled with just such cheesy pus, which, during treatment, is often formed anew, and after syringing away we see coarse crumbs or scaly tissue, which bears great resemblance to cholesteatoma. But on examining this refuse with the microscope, it is found to be nothing but pus-corpuscles, which have been compressed against the walls of the cavity, and have so taken on a scale-like appearance. Hence when we see or hear of operations for cholesteatoma in small children, in whom no microscopical examination has been made, of the evacuated masses, we are actually to think of collections of pus and not of cholesteatomata at all.

There is but one condition in the ear which is of any value in forming a differential diagnosis between a genuine cholesteatoma and the hyperplasia of epidermis in the middle-ear spaces. Bezold has expressed the opinion, that epidermis can only proliferate into the middle-ear spaces, where the epidermis of the *Mt* is carried over to the mucosa of the tympanum by a sort of bridge, that is to say, by the union of the margin of the perforation with the mucosa, or where the *Mt* is totally destroyed to the very margins. If now, this opinion be true, and it seems to all observers extremely probable, then such a condition of affairs in doubtful cases would be of the greatest value in the diagnosis between hyperplasia of epidermis and accumulations in the middle-ear spaces, but not, as Bezold erroneously states, for the diagnosis of a genuine cholesteatoma.

The difficulty of separating clinically these varieties of disease may be the reason why opinions still vary in regard to the prognosis as well as to the best method of operation in cholesteatoma.

One opinion, often expressed, is that, relapses being unavoidable, we must maintain a permanent opening behind the ear by transplantation of skin, through which to remove, from time to time, the masses as they constantly recur. The other opinion is that in avoiding the cavity behind the ear, and by the greatest possible removal of pathological masses through the meatus, and deepest possible excavation of the adjacent territory, relapses are prevented, whilst by a plastic operation at the orifice the bony cavity is rendered permanently visible.

These two operations with their modifications differ then from one another in that in one we have an opening behind the meatus, in the other it embraces the meatus. So that there is no actual difference, only in the locality and the size of the permanent cavity. The main idea is to keep the latter dry and as much as possible accessible to view. But where this can be permanently obtained from the meatus itself, it seems to me that no one will ever desire to make the monstrous opening behind the auricle.

Finally, let me say that the operation as suggested by Zaufal, embracing the meatus and adjacent tissues, makes a cavity which greatly resembles that produced by the curative processes of nature, and is probably the most correct one to perform.

A brief history of four cases of spontaneous recoveries is now appended. Of the first we have only the skull to show (as discovered in the Rostock Museum), whilst the other three were observed during life at our clinic.

CASE I.—Female skull, at the age of about twenty-five. The external surface of the mastoid is sawed away so as to leave the spaces open. The left mastoid exhibits the usual pneumatic spaces, whilst the right is transformed into a large cavity of sclerotic bone without pneumatic cavities. The cavity is formed by the breaking down of the tympanum, mastoid, antrum, and meatus. The posterior and upper walls of the meatus have disappeared, and the lower wall is eroded. The promontory and windows of the tympanum are normal. The facial canal is transformed into an open cavity about 6 mm in length. The vestibule above is slightly opened. The cavity behind extends to the sigmoid flexure, outward to the cortical tissue of the mastoid process, and at the mastoid fossula (antrum pit) is a perforation outward with smooth walls.

The cavity is 25 mm high, 23 mm in antero-posterior diameter, and 21 mm from the promontory to the edge of the meatus externus. There are no fissures between the tympanum and fossa jugularis, nor between the tympanum and carotid canal. The cavity is nine-pin shaped, due to the considerable share which the meatus takes in the formation, and owing to the fact that the threshold between the tympanum and mastoid antrum, generally so prominent in the other cases to be reported, is here very much flattened by erosion. The walls of the cavity are smooth, shiny, free from caries or necrosis or from osteophytes; in other words we see a perfect bony surface.

We know nothing of the history of the case, nor of the cause of death, but the anatomical condition shows a cavity due to no other cause than an extensive and genuine cholesteatoma. The remarkably nine-pin-shaped appearance shows a uniform enlargement from erosion, to which only the hard bony substance of the cochlea, and the resistant lamina vitrea, offered any resistance. A cavity so regular in form could not possibly have been caused by simple suppuration in the bone, nor by hyperplasia of epidermis into the middle ear, but only by a genuine and gradually enlarging tumor, and, considering the locality of the growth, only by a true cholesteatoma. We can even go farther and assume that the cholesteatoma was cured, and that it was exfoliated spontaneously, and that the recovery must have existed for some time before the patient's death. So long as it remained in the meatus, it remained in contact with the open air. But in such cases, from easily comprehensible causes, and according to general experience, there exist in and about the tumor inflammatory processes which are easily recognized by the roughness and necrosis on the bone. But here the interior of the cavity is smooth, and thus we see that no inflammatory processes could have existed for quite a while at least before the death of the patient.

In the three ensuing cases we cannot diagnosticate a genuine cholesteatoma, but simply "*chronic otorrhœa, with occasional exfoliation of cholesteatomatous masses, or masses resembling that sort of tissue.*"

CASE 2.—Mrs. H., æt. forty-six, March 23, 1888, has suffered for years from suppuration of the right ear, but had no treatment. Lately, slight pain in the ear led her to seek advice. Right meatus filled with a plug of cerumen, offensive pus, and layers of epidermis. After removal of this plug, granulations, discovered in the bottom of the meatus, were treated with the snare and chromic acid. Later still, scales resembling cholesteatoma were removed from time to time by syringing or with a curette.

After the meatus was finally thoroughly cleansed, the lower half of the *Mt* was seen to be preserved, with cicatrices. Most of the upper portion of the *Mt* is lost, and we can see that the lateral bony wall of the tympanum is gone, so that the tegmen tympani lies plain in sight. Backward, the cavity extends into the mastoid cells. A sort of ridge lies between the tympanum and mastoid antrum, within which the facial nerve is to be traced. The suspensory ligament of the hammer is lost. The stapes can be seen in good preservation.

Suppuration still continued to trifling amount in September, but the capacity of the cavity, being measured by filling with water, was found to hold double that of the other meatus. In January, 1889, a fresh granulation was removed. In 1890 the patient reported once more with thickened scaly masses in the ear, which were again removed with the syringe. A few weeks later the cavity was dry and has remained so during the past six years.

CASE 3.—A boy of sixteen has had otorrhœa on the left side since childhood. The right ear was also slightly affected at the same time. In July, 1895, the right *Mt* showed a small dry perforation, whilst the hammer and a part of the perforation margin were adherent to the tympanic wall, which was covered with epidermis.

The left meatus is filled with a hard plug, which could not be removed either by syringing or with the forceps. But after being softened and smoothed with glycerine it was easily removed and found to be 2.5 *cm* long and covered with crumbling masses of cerumen and softened epidermis. The interior was occupied with a hard pyramidal body about 1.5 *cm* in length, which on closer inspection *proved to be a sequestrum*. The microscopic examination showed it to be composed chiefly of softened epidermis. Examination of the meatus now showed that the entire tympanum, together with the recessus epitympanicus, the mastoid antrum, and the posterior portion of the meatus, had been transformed

into a single large cavity. The region of the promontory is sunken. The ossicles are absent. The epidermis on the medial antral wall is thicker than at other portion. A few days after removal of the plug the cavity was dry, with the exception of the spot of thickened epidermis. On tuning-fork examination the patient declared that he could perceive sounds in the right ear. He was not seen again.

CASE 4.—Miss F., æt. thirty-eight, observed a slight, painless discharge from the right ear in 1883. In 1884 she had an attack of vertigo and nausea, with loss of equilibrium. This condition ceased after ten days, the chief treatment being ice-bags to the head. In 1884 polypi and whitish scales are reported to have been removed from the ear. In 1885 there was slight hemorrhage from the ear, which was soon relieved by the use of iodoform.

The patient also asserts that about the same time a deep incision was made into the meatus.

August, 1895.—Deafness right ear; loud voice only close to the meatus. Tuning-fork heard only on the healthy side—the left.

Examination of the meatus shows a large cavity filled with epidermis, and embracing the recessus epitympanicus and the mastoid antrum. At the bottom of the hole a ridge divides it into two portions. This represents the threshold separating the tympanum and mastoid cells, and in which the facial nerve courses. The promontory and both windows are normal. The ossicles are absent. No hyperplasia of epidermis. Tubes free. During the time that the patient remained under observation (several months) nothing was observed in the cavity but a few flakes of skin. The capacity of the cavity was not measured, as we feared that the presence of water would excite fresh inflammation and suppuration.

These cases are published simply to call attention to the possibility of others coming to light. *The observation of the manner in which such cases proceed, and the picture which they offer in individual cases, will surely give us suggestions valuable for operative interference in other cases, by means of which we shall then obtain greater surety of a favorable result. Our investigations seem to prove that true cholesteatomata, as well as cases hitherto called by that name, can be spontaneously ex-*

foliated through the meatus and so be cured. Therefore, we are of the opinion that all such masses, of whatsoever nature, ought to be removed by Zaufal's method without a permanent retro-auricular orifice. Further observation will show in which cases this method shall prove to be the most trustworthy.

For we have a right to believe that genuine "cholesteatoma," Habermann's "retention masses," Lentert's "epithelial cysts," and eventually other epithelial morbid products resembling cholesteatoma, so far as the prognosis of relapses is concerned, will offer differing results, and for that reason ought to be operated in various ways.

Finally, I mention the *significance of closure of the tubes*, as suggested by Haug and others (possibly, too, to be artificially produced), in the cure of "cholesteatomatous" cavities. The idea of closing the tube, is that we shall thus prevent the entrance of moist air and micro-organisms into the operative cavity and so prevent a new infection. To me the suggestion seems visionary indeed. For in Case 4 the bony cavity had been cured for ten years, despite the fact of a patent condition of the tubes. In the other cases we unfortunately made no observation of this condition. But, more than this, we conclude from other observations, that extensive ventilation of the middle-ear spaces through the meatus and tubes can only act favorably upon the diseased mucosa. And here we recall the fact, that the permanent cure of chronic middle-ear suppuration in children with adenoid vegetations in the naso-pharyngeal space is only obtained when the tubes again become patent by removal of the vegetations.

And here let me cite a case of a young girl who was operated upon by Koerner's method. The empty tympanum (only the plate of the stapes remained) rapidly clothed itself with epidermis. Before the operation, whisper at 50 *cm*, and after at 450 *cm*. Finally, mulberry-like granulations appeared on the inferior turbinates, nasal breathing was obstructed, and hearing for whispered sounds fell to 250 *cm*, though the cavity in the ear remained unchanged. After removal of the hypertrophies with the snare the hearing became as good as before. The patient also observed that when she had a cold she heard worse.

This case can be explained thus: That the epidermis which covered the cavity remained absolutely dry with good ventilation, whilst when the ventilation became impeded it swelled again and diminished the mobility of the stapes. The idea, therefore, is not far-fetched, that such a swelling makes the epidermis more susceptible to any renewed infection.

ACOUSTIC RAILWAY SIGNALS AND ACUTENESS OF HEARING.¹

BY DR. H. ZWAARDEMAKER, OF UTRECHT.

(*With Plates IV. and V. of Vol. XXVIII., Germ. Ed.*)

Translated and Abridged by Dr. CHARLES H. MAY, New York.

IN 1880, S. Moos called attention to the dangers to which the public were exposed on account of certain diseases of the ear occurring in locomotive engineers and firemen, and related five instances of this kind; one of these was an engineer whose deafness had been responsible for a collision. He believed that certain unexplained railway accidents might be traced to impairment of hearing on the part of employees. In 1881, D. Schwabach published statistics showing thirty-three cases of organic ear disease among 160 railway employees, but he failed to determine to what extent such diseases incapacitated the person in the proper performance of his duties. Such information was supplied by H. Pollnow, who made a study of the six signals used by the company whose employees Schwabach had examined.

These signals were the following:

1. The conductor's signal for starting, given with an ordinary whistle.
2. The signal for stopping, given with an ordinary whistle.
- 3 and 4. Switching signals, given with an ordinary whistle or horn.

¹ An address delivered at the International Conference of Railway and Steamship Surgeons, held in Amsterdam, September 20 and 21, 1895.

5. The explosion of a cartridge placed upon the rails.
6. The steam-whistle.

While riding upon a locomotive, Pollnow found the noise so great, that to understand speech it was necessary to shout into the ear; neither the rolling of the cars nor the conductor's whistle could be heard; but the report of cartridges and the steam-whistle could be heard easily, even by employees who were unable to hear whispered speech beyond one metre. Pollnow arrived at the conclusion that the ordinary whistle was absolutely worthless in signalling trains in motion, but that the important signals given by the steam-whistle and the cartridge could be heard even by those who suffered from deafness of a comparatively high degree. Regarding these two signals as essential, he considered employees fit for duty if able to carry on an ordinary conversation, taking into consideration the fact that in signalling, optical signs are added to those perceived by the ear.

It is not surprising that a sharp controversy followed the publication of such widely differing views. Moos pointed out that optical signals were not official, and were of no value at night or during unfavorable weather; while Pollnow endeavored to strengthen his own views by the evidence of railway surgeons who found that the employees did not consider themselves handicapped by disturbances of hearing. Moos's views were endorsed by Bürkner, Lichtenberg, and Schmalz, while Hedinger rather agreed with Pollnow. This difference of opinion makes the subject a proper one for consideration at this conference.

It must be admitted, that in the case of old and practised employees, certain defects of the organs of sense are offset by the advantages of experience, and in this way, such men prove more reliable than younger and inexperienced persons; but it is evident that this is true only within certain limits, and the question arises, what are these limits? After these have been established, it will be necessary to subject railway employees to aural examinations at regular intervals, investigation having established the fact that the percentage of employees afflicted with ear disease increases with the length of service. A locomotive engineer who had

perfect hearing upon entering the service as fireman, will probably suffer from some diminution at the end of several years. This is shown by Hedinger's table.

TABLE SHOWING THE NUMBER OF EMPLOYEES WITH HEARING LESS THAN SPEECH AT ONE METRE.

Length of Service.	Total Number of Employees Examined.	Percentage of Employees Affected.
1 to 5 years	24	25 per cent.
5 " 10 "	37	35 " "
10 " 15 "	44	50 " "
15 " 20 "	25	60 " "
20 " 25 "	10	90 " "
25 " 30 "	6	75 " "

This table shows that with succeeding years the number of employees with hearing less than speech at one metre increases. This result was originally attributed to the heat and poisonous gases from the fire, changes in temperature, dust and smoke, especially since pharyngeal- and middle-ear catarrh occurred frequently, while labyrinth affections were seldom found. But later, Bürkner showed that the older engineers also suffered from loss of perception of the higher tones with diminution in bone-conduction, symptoms resembling those of boiler-makers' deafness. This is not surprising, since a running locomotive makes a great deal of noise, and, as a result, the traumatic effects of concussion are added to those of catarrh.

Let us now endeavor to establish the limit value of the power of hearing within which railway signals can be heard sufficiently well. This limit cannot be measured by the acuteness of hearing for whispered or ordinary speech, because although an extensive series of tones of varying pitch are used, we know that important tone-gaps may exist without noticeable interference with the power of hearing speech. This becomes evident upon considering the distribution of tones of various pitch. First in importance are the vowel sounds which occupy a position in the scale varying somewhat according to the dialect, between c^2 and f^4 ; above

these are a series of sibilant consonants which, according to O. Wolf, extend to c^6 ; and below, there are a number of mutes which, according to the same authority, extend pretty far down the scale. In speech, these tones are employed in varying degree. We appreciate spoken words by several determining sounds, for instance, the open vowels and the initial and final consonants. If we hear one of these less plainly than the others, we select some other letter in the word. A person whose hearing is defective on account of the existence of a tone-gap, will not seek the determining sounds within the missing portion, but from the neighboring part of the scale; in this way, he preserves good hearing. But in endeavoring to catch a certain signal the pitch of which happens to correspond to that of the tone-gap, he would be absolutely deaf so far as this signal is concerned.

This led me to determine the pitch of the various railway signals—the same signals which Pollnow investigated:

I. *The Ordinary Whistle.* In Holland, the conductors and their assistants are provided with wooden whistles, consisting of small covered organ-pipes about $1\frac{1}{2}$ cm long. Slight blowing produces a tone of 5,550 vibrations, f^6 ; with greater force, the tone is c^7 . Most whistles produce tones occupying that portion of the scale comprised between the fifth and seventh marked octaves—tones corresponding to the upper portion of human perception. This probably explains why the wooden whistle is provided with a ball in its interior; the to-and-fro movement of the sphere causes changes in pitch, thus preventing the exhaustion which would follow the continuous perception of the limit-tones.

Can the older engineers hear the ordinary whistle sufficiently well? The answer to this question depends upon what we consider sufficiently well. It is certain that they do not hear the whistle as well as persons with normal ears. The shrill tones approximate the limit-tones of human perception, which are lost or diminished to older engineers, leaving only the weak fundamental tone in the fifth marked octave; this would not likely be heard against the wind beyond the length of several cars. There are a number of indications which go to show that this signal is not suffi-

ciently well heard; and I was assured by the employees that the engineers are frequently unable to hear it at all.

II. *The Signal-Horn.* This is a much louder signal. The horn which I used in my experiments was tuned to *a d'orchestre*, a tone corresponding to the middle of the scale of human perception. This pitch is particularly well selected; the tone can be heard comparatively well, even though the upper limits of the scale have been curtailed by labyrinth disease, and the lower by repeated attacks of catarrhal processes. Only severe forms of sclerosis would interfere with the perception of this tone, and since it approximates the characteristic tone of the open vowel *a*, we are justified in assuming that persons who are unable to hear it must suffer from such marked diminution of hearing for speech that their deafness would be quite noticeable. Therefore, all engineers in active service can undoubtedly hear the signal-horn which has been tuned to *a d'orchestre* more or less plainly, even though some diminution in the acuteness of hearing exists. When the locomotive is in motion, there might be some difficulty in hearing, especially since, according to Gradenigo, acoustic exhaustion is a prominent symptom in boiler-makers' deafness. With a strong and interfering wind, this loud sound is deadened to an astonishing degree, and the distance at which the switching-horn can be heard is very much diminished. Under such circumstances, with the train in motion, it seems likely that this signal can only be heard by the normal ear.

III. *The Steam-Whistle.* The steam-whistle of locomotives is supposed to be tuned to a relatively low fundamental tone, a^2 , for instance; but when the steam enters with greater force, upper tones are added, eclipsing in intensity the fundamental tone and approaching in pitch the upper limits of human perception—the portion which, according to Bürkner, is most defective in older locomotive engineers. This may explain the frequent sounding of locomotive whistles of such uncomfortable intensity; the high tone which sounds so harsh and is so distressing to the traveller, seems weak to the engineer; unconsciously he whistles for a long time and lets

the steam in at full force. This seems remarkable, because with ascent of pitch the intensity for a diseased ear diminishes. Perhaps the accompanying hissing makes the perception of the tone more difficult, while the total excitation of the sound increases—as was pointed out long ago by Burkhardt-Merian in connection with Galton's whistle.

From the standpoint of the aurist, there are undoubtedly many of the older employees who hear the steam-whistle with diminished intensity and, at a distance or against the wind, only with difficulty. On account of the importance of the signal, it is possible, under certain circumstances, that this jeopardizes safety.

IV. *The Explosion-Signal.*—In the infrequent instances in which it is employed, the explosion-signal, produced by a cartridge placed upon the tracks, is even of greater importance than the steam-whistle. Such a report consists of a strong principal vibration, to which is added a series of rapidly diminishing auxiliary vibrations. According to Exner and Brücke, these aperiodic vibrations are perceived by the same end-apparatus which analyzes periodic sound vibrations. Probably a series of fibres of the membrana basilaris in immediate proximity is excited, the position of which determines the apparent pitch of the report. On account of the extensive area of the excitation, it is probable that the explosion of a cartridge is heard even by a diseased ear with tone-gaps corresponding to the upper and lower portions of the scale; this view agrees with the results of Pollnow's investigations. The report-signal, therefore, answers its purpose perfectly.

If, in any given case, we wish to ascertain whether a person can conveniently hear the signals just enumerated, the simplest way is to examine the man with Bezold's continuous series of tones and thus map out a field of hearing. We may make use of the original method of Hartmann, of that of Gradenigo or of the plan which I have recommended; practically, all these methods accomplish the same results. This is shown, in a typical case, by the figures on Plates IV. and V.

The simplest plan is to determine the upper and lower

limits of tone perception, then to discover any tone-gaps and finally to examine the acuteness of hearing at a number of points by means of tuning-forks. Such results are marked upon a chart, a curve is drawn joining the ascertained heights of ordinates, and the pitch of the signals is noted; a glance will then suffice to determine exactly to what extent the deafness of the individual interferes with his power of hearing signals.

Let me illustrate by an example occurring in a machinist, thirty years of age, who presented a moderate amount of sclerosis with slight loss of the upper tone limit. This man could hear the ordinary whistle pretty well when it sounded its fundamental tone. The first over-tone, the octave, produced by forcible blowing, was heard less distinctly. He heard the ordinary whistle, forcibly blown, at about one-twelfth the normal distance; when softly blown, at about three-fifths the normal distance. Let us assume that the latter is somewhat over two kilom., which was the result arrived at by my measurements. Then the man's hearing distance for the whistle would be 200 metres. In the absence of wind, this would just be sufficient to enable him to do switching duty; but in wind or rain, he would clearly be incapacitated from such service.

He could hear the steam-whistle comparatively well when blown softly, but less distinctly when forcibly sounded. Finally, the report-signal would probably be heard very well by such a patient, though the period of reaction would probably be of somewhat greater duration than normal on account of diminished excitation. Under certain circumstances, this might give rise to danger, especially since, even in the normal ear, the period of reaction is somewhat longer on account of the suddenness of the report-signal.

In regard to hearing for speech, it is evident that this ought not to be diminished beyond a certain degree. While the locomotive is in motion, it is often necessary for the engineer to give a command to the fireman or to consult with him. Agreeing with Pollnow, my experience convinced me that even for the normal ear it is difficult to understand speech when travelling upon a locomotive. In certain cases,

the paracusis Willisiana might be of advantage to the affected ear ; but we have no knowledge that this symptom is present in locomotive engineers and firemen. Even when the locomotive is at rest, defective hearing gives rise to difficulty and danger through misunderstanding, for we all know how often, under such circumstances, the opposite is done of what has been commanded. Hence, even for older railway employees, I believe the minimum requirement should correspond to that adopted by military regulations—the whispered speech at one metre.

We are led to the following conclusions :

1. When engaged for service, locomotive engineers and firemen should possess normal hearing in a general way, or at least not more than a slight diminution.
2. At intervals of from two to five years, they should be re-examined with a continuous series of tones and their field of hearing determined ; this will then indicate their ability to hear acoustic signals sufficiently well.
3. Employees on duty should have a hearing distance for whispered speech of at least one metre.

REPORT OF THE AUSTRIAN OTOLOGICAL SOCIETY; MEETING OF APRIL 28, 1896.

Translated by Dr. C. H. MAY, New York.

DEMONSTRATIONS.

1. Prof. J. GRUBER presented a six-year-old girl with **Malformation of the Auricle and Absence of the External Auditory Canal with Marked Asymmetry of the Face.**¹ Dr. Gruber did not expect any good result by trying to increase the hearing in this ear, but thought the auricle, which was tilted forward, could be stitched back and in this way the appearance of the child could be improved.

2. Dr. FERD. ALT presented a patient, forty years of age, who took 149 grammes of salicylate of sodium for acute muscular rheumatism. From the beginning of the disease, there was tinnitus in both ears, accompanied by a dull headache. In November, while still taking the salicylate, she began to have attacks of vertigo in which she fell to the right and became unconscious for a short period. Tinnitus of the right side was constant. These attacks were repeated every two or three weeks at first; of late they were of daily occurrence. R E *Mt* entirely replaced by a cicatrix. Weber lateralized to the left. Rinne +, left. On the right side neither high nor low tones of the tuning-fork are perceived, and when applied to the mastoid, they are referred to the left ear. Watch: left, 1 metre; right, 0. Loud speech is heard on right side only in immediate proximity (probably heard by left ear). The case is interesting because the use of large doses of sodium salicylate undoubtedly produced labyrinth (acoustic) disease, and because this affection was unilateral.

Dr. POLLAK inquired whether his colleagues had had any success

¹ See a similar case, with drawings, in these ARCHIVES, vol. xix., p. 17.

in the treatment of Ménière's disease with quinine. He had had favorable results with small doses, 0.10 given three times a day. GRUBER, POLITZER, and URBANTSCHITSCH reported unfavorable results from the use of quinine, especially in large doses, and on this account had discontinued the use of this remedy.

3. Dr. ALT also presented a patient, forty-six years old, who, while intoxicated, had fallen down a flight of stairs and lay unconscious. Upon recovering consciousness, there was hemorrhage from the nose and the right ear. Several days afterward, he presented himself at Gruber's clinic in the following condition: The right side of the face was swollen and discolored, right sclera presented extensive subconjunctival hemorrhage; almost complete right-sided facial paralysis; normal fundus; movements of eyeball complete; sense of smell and taste normal; no disturbances of X., XI., and XII. cranial nerves; pulse 84; temperature $36^{\circ}.3$; in front of the right ear there was a sensitive swelling of the size of a nut; the region of the tragus was discolored, the canal open and its walls covered with dried blood. A soft tumor, about the size of a bean and of a dark reddish-blue color, sprang from the upper and posterior walls of the canal and concealed the greater part of the drum-membrane, the visible portions of the latter being of a livid color and bulging; left ear normal; Weber lateralized to left; Rinné +, left. Neither high nor low tones are heard by right ear, and when the tuning-fork is placed upon the mastoid the sound is referred to the left ear. Watch, right 0. Unsteadiness when standing with eyes closed; in walking there is a tendency to fall to the right. In hawking and blowing the nose, clotted blood escapes from the mouth (right side of the nose). After the lapse of a week, the swelling in the canal had disappeared, and at the end of twelve days there was no longer any escape of blood upon hawking or blowing the nose, and the right drum-membrane presented a normal appearance. The facial paralysis disappeared rapidly under Faradism. The vertigo was replaced by tinnitus. The tuning-fork signs remained the same.

4. Dr. ALT also presented a boy, seven years of age, who was brought to Gruber's clinic in January, 1895, for **congenital deaf-mutism**. Both parents were deaf-mutes and had been educated in an institution. A younger sister was hard of hearing. The drum-membranes of the patient were normal. There was no response to the voice, whistle, or trumpet, and he gave no signs of

having perceived the tones of a tuning-fork applied to the head. Acoustic exercises were begun at the clinic and continued by the boy's relatives. Two months later, the boy was able to hear and repeat every word which was addressed to him. Previous to his visit to the clinic, his relatives had considered him a deaf-mute and took no pains to teach him how to speak. As a result of the acoustic exercises, he came in constant contact with these relatives, who, unlike his deaf-mute parents, conversed with him; in this way he received acoustic impressions and learned to talk. Such children must not, of course, be placed in institutes for deaf-mutes; it is very easy to make them hear and speak by removing them from their deaf-mute parents.

Discussion.—POLITZER considered the case one of psychic deafness and GRUBER and URBANTSCHITSCH agreed with him. The latter cautioned against placing such children in institutes for deaf-mutes since, under such circumstances, there would be no possibility of a return of hearing.

5. Dr. MAX presented a man, twenty-nine years old, who had a **Peculiar Defect of the Left Auricle.** Corresponding to the middle of the upper half of the left auricle there was a circular opening about the size of a cherry-pit, beginning in the upper third of the antihelix and extending upwards about 7 to 8 mm. Beyond the upper extremity of this defect, the normal upper two-thirds of the crura antihelics were seen. In other respects the auricle was normal. The margins of the defect were sharply defined and not cicatricial, and the corresponding posterior surface of the auricle presented an opening of the same size and characteristics. The defect was not congenital but developed in the course of a few months during the second year. No information could be obtained about the original disease.

TRANSACTIONS OF THE FIRST AUSTRIAN
OTOLOGICAL CONGRESS, HELD ON
JUNE 28 and 29, 1896.

ACCORDING TO THE OFFICIAL REPORT OF DR. JOSEF POLLAK.

Translated by Dr. MAX TOEPLITZ.

The Otological Congress was opened by Professor JOSEF GRUBER with a welcoming speech. For the following year Professor POLITZER was elected President, Professor GRUBER Vice-President, the private docents POLLAK and BING Secretaries, and Professor URBANTSCHITSCH Treasurer. Forty-three aurists were present.

I.—DEMONSTRATIONS.

I. Director HELLER demonstrates a **Case of Psychic Deafness.**

A boy, aged three and a half years, could not understand, before the beginning of his instruction, a single word addressed to him, and his attention could not be directed to other perceptions of sound. He exhibited to the utmost reflex reactions, and these only upon very loud impressions of sound. Among the word fragments still present, the words "mamma" and "Berta" were the most distinct, but without meaning to him. In addition, the boy, as a rule, was in a state of extreme motory excitement, which at times increased to regular maniacal paroxysms, during which the child vehemently cried at the top of his voice, struggled with hands and feet, bit at the nurses, and injured himself. After the excitement had reached such an extreme degree, a reaction in form of complete collapse ensued.

In entire contrast with the unsusceptibility of the boy to isolated *loud* perceptions of sound was the fact that melodies pro-

duced by a music-box or grinding organ were best suited to quiet him somewhat, even during paroxysms of excitement. Slow improvement took place after treatment of four months' duration, which, psychically quieting, succeeded in exciting the consciousness of the connection of word and subject. At the time of the presentation the boy was able to speak and understand everything.

2. Professor URBANTSCHITSCH demonstrated **Eight Cases of Radical Operation**, in which the retro-auricular opening had closed; and

3. **A Case of Psychic Deafness.**

4. Professor GRUBER: **Angioma of the Auricle Cured by Operation.**

GRUBER presents the illustration, taken from nature, of an angioma of the auricle, which neither by its exterior nor by the exactest objective examination betrayed its nature, but rather exhibited the symptoms of an ordinary atheroma. It was operated with knife and sharp spoon without much loss of blood.

5. Professor POLITZER: **A Cured Case of Otitic Pyæmia with Thrombosis of the Jugular Vein and Purulent Metastasis in the Left Elbow-Joint.**

A young man, aged nineteen, was seized, when seven years old, with severe scarlatinous diphtheria of the nose, naso-pharynx, mouth, and both tympanic cavities, which ended in almost complete destruction of both membranæ tympani and considerable loss of hearing.

Ten years later an acute exacerbation set in in the right middle ear, implicating the mastoid, which had to be opened, and after two days the sinus was laid bare, since the temperature had continued to be high (39°-40° C.). The sinus appeared normal, but its blood contained streptococci. No improvement took place and the temperature remained high with daily chills. A painful swelling upon the right side of the neck now appeared, which proved to be a thrombus in the jugular vein.

The daily chills continued for two weeks, together with the development of a phlegmonous inflammation around the thrombosed jugular vein, exhausting the patient's strength. On the twenty-second day since the beginning, a purulent metastasis developed in the left elbow-joint, whereupon the chills ceased and the temperature decreased to normal. The patient was cured after four weeks with an ankylosis of the joint and occasional moderate bilateral otorrhœa.

6. Dr. BING presents a **Case of Chronic Purulent Otitis Media which recovered after Removal of the Malleus.**

7. Dr. GOMPERZ presents a girl in whom, on account of caries, the **Radical Operation with Koerner's flaps** was performed.

The condition of the posterior flap formed from the external meatus aroused the keenest interest. After its firm attachment, it had grown over the antrum and the tympanum so as to make the external meatus appear at the bottom as closed by a membrane, communicating only through a narrow opening with the tympanic cavity. After cessation of discharge which had found its way through this opening, the latter began spontaneously to increase, apparently by absorption—not by necrosis—of the covering cutaneous flap, and after two weeks the antrum, attic, and tympanum, lined by delicate, glistening cicatricial tissue, were exposed in the way they presented themselves at the demonstration.

8. Dr. MAX presents the patient with the **Auricular Defect** demonstrated at the last meeting of the Society as cured.

He succeeded in closing the defect by sewing the trimmed edges together with three sutures under cocaine.

II.—PAPERS.

I. Dr. R. SPIRA, Cracow : **A Case of Central Ostitis of the Mastoid Simulating Neuralgia of the Trigemini.**

A robust man, aged seventy-three, suffering for some time from chronic otitis media, was seized with acute tympanitis following influenza. Simultaneously, severe pain in the neck and larynx and the entire corresponding half of the head appeared. Gathering in the tympanum, let out by paracentesis, took its regular course, with cicatrizations of the membrana tympani in the third week. Absence of pain in the ear and mastoid process, which were present in the entire corresponding half of the head, and even extended at times to the other side of the head without apparent cause. Diagnosis: neuralgia of the trigemini. Treatment: iodide of sodium internally and galvanization. After the second sitting, paresis of the abducens of the same side set in. Insomnia, anorexia, wasting away, and falling off of strength. No fever, no cerebral symptoms. In the ear and mastoid process nothing

of importance. From time to time, however, not until several months had elapsed, temporary symptoms of irritation in the mastoid region with simultaneous decrease of cephalalgia at every attack. After about eight months, opening of a subperiosteal abscess of the mastoid, which was found perforated by a fistula. Caries and suppuration at the bottom. Scraping, plugging, and antiseptic dressing. Recovery after six weeks. Since the operation, complete and definite disappearance of headaches, rapid improvement of paresis of abducens.

2. Professor POLITZER: **Ménière's Complex of Symptoms in Traumatic Lesion of the Labyrinth.** Demonstration of the histological examination.

The case occurred in a cobbler, aged twenty-one, who, on December 28, 1895, was struck upon the head by a mortar trough falling from a building in erection, whereupon he rapidly fell down, simultaneously losing his consciousness. The examination of the patient at the clinic of Professor KRAFFT-EBING, on January 17, 1896, discovered paralysis of the right facial nerve, paralysis of the right half of the velum palati, paralysis of taste in the right half of the tongue, staggering gait with tendency to fall toward the left, and defective intelligence.

Aural examinations, on January 24, 1896, showed bilateral retraction of the dull membranæ tympani and total deafness.

On January 31st diffuse headache, vomiting, and stupor suddenly appeared with high fever. Worse during the next few days; suppuration of the right middle ear simultaneously developed, with bulging of the right membrana tympani. Paracentesis with subsequent profuse otorrhœa does not influence the cerebral symptoms, and death ensued three days later under the symptoms of diffuse meningitis. A detailed account of the course of the disease up to the fatal issue was given by Dr. JOSEPH HIRSCHL.

The post-mortem revealed diffuse purulent meningitis, fracture of the base of the skull through both petrous bones, extending to the inner wall of the tympanum. Empyema of the sphenoidal cavity and both antra Highmori. Suppuration in the right tympanic cavity. The fissure through the pyramid ran bilaterally 2 mm from behind the porus acusticus internus to the upper edge of the pyramid, and from there at the upper surface of the pyramid to the limit of the tegmen tympani. On the right side, the fracture ran vertically through the greater part of the

cochlea ; on the left side, through the lower cochlear turn. Bilateral hemorrhagic exudate in the cochlear space.

The microscopical examination of the decalcified labyrinth gives the following result on the right side : Both cochlear scalæ are filled in all turns with an exudation consisting partly of fine granules, partly of round cells ; at isolated places of the endostium, proliferation of nucleated connective tissue. The details of Corti's organ cannot be distinguished. The nerve tracts of the modiolus, the spiral plate, and spiral ganglion are imbued with a minutely granular substance and granular cells. The same patches of exudation as in the cochlea are found in the utricle, ampullæ, and semicircular canals. Upon the external surface of the membranous ampullæ and semicircular canals, newly-formed nucleated connective tissue is rapidly developing.

In the left labyrinth a scantier exudation is deposited than in the right. On the other hand, the scala tympani of the first cochlear turn exhibits a delicate reticular new-formation of connective tissue, containing numerous spindle-cells, nuclei, and, in addition, interspersed migratory cells. Proliferations of newly formed connective tissue of the endostium are found also in the second cochlear turn and in the cupula. Corti's organ cannot be recognized on account of extensive proliferation of epithelium. The nerve tracts of the ramus cochleæ present the same changes as on the right side. In the vestibule, the ampullæ and semicircular canals, isolated places of the endostium are thickened. The membranous structures of the vestibule and the semicircular canals are but slightly altered.

In the epicrisis of the case, POLITZER holds that the total deafness and Ménière's complex of symptoms are sufficiently explained by the result of the anatomical examination. The empyema of the sphenoidal and maxillary cavities, and the suppuration of the right middle ear are undoubtedly the consequence of the supuration of the pharyngeal structures produced by the fracture at the base of the skull. With reference to the origin of the meningitis of this case, it could not be definitely settled whether it was the consequence of the empyema of the sphenoidal cavity or of the suppurative otitis media, or of a lesion of the meninges which could macroscopically not be ascertained. The intense inflammatory new-formation of connective tissue, five weeks after the injury, is histologically of especial interest.

The paper was illustrated by a number of large charcoal drawings and by demonstrations of the histological specimens.

3. PROFESSOR GRUBER.—Contributions to the Study of the Otitic Intracranial Affections.

The lecturer had perused 40,073 records of autopsies with reference to the occurrence of otitic intracranial affections.

1806 corpses (1242 males, 564 females)—viz., 4.5 %—presented as the cause of death one or more inflammatory intracranial affections.

Intracranial otitic sequelæ were found in 232 corpses (163 males, 69 females)—viz., 12.8 %, considering the total number of 1806 intracranial affections, and 0.58 % in proportion with the total number of autopsies (40,073). Among these 232 cases, 81 autopsies were furnished by aurists; the remaining cases were taken from the surgical and internal clinics, viz., 34.91 % by aurists and 65.09 % by clinicists and surgeons.

The aural affection was found :

In the right ear.....	118 times	= 50.87 %
In the left ear.....	103 "	= 44.39 %
In both ears.....	6 "	= 2.59 %
Not recorded	5 "	= 2.15 %

Intracranial, secondary inflammations occurred with simple otitis media suppurativa, without caries, 65 times (44 males, 21 females) = 28 %, consequently 167 cases complicated with caries (128 males, 39 females) = 72 %.

The number of autopsies without caries and with sinus thrombosis was 42 (24 with solid, 18 with purulent, thrombi); the number of autopsies with caries and sinus-thrombosis was 106 (64 with solid and 42 with purulent thrombi).

The sigmoid and lateral sinuses were most frequently thrombosed, viz., in the 42 cases without caries, 24 times; in the 106 cases with caries, 73 times (73 males and 24 females).

In the simple otitic affections without thrombus in the sinus, there was found :

Meningitis.....	31 times	= 13 % (21 m., 10 fem.)
Cerebral abscess.....	19 "	= 8.2 % (14 m., 5 fem.)
Cerebellar abscess....	Once	= 0.4 % (1 female)

In the simple otitic affections with thrombous in one sinus, there was found :

Meningitis.....	12 times	(7 m., 5 fem.) = 5.5 %
Cerebral abscess.....	Twice	(2 males) = 0.8 %

In the cases with caries of the temporal bone, without sinus-thrombosis, there was found :

Meningitis.....	40 times (34 m., 6 fem.)	= 17 %
Cerebral abscess.....	13 " (12 m., 1 fem.)	= 5.6 %
Cerebellar abscess	12 " (8 m., 4 fem.)	= 5.5 %

In the cases with caries and thrombosis there was found :

Meningitis.....	21 times (17 m., 4 fem.)	= 9 %
Cerebral abscess.....	7 " (6 m., 1 fem.)	= 3 %
Cerebellar abscess....	4 " (2 m., 2 fem.)	= 1.6 %
Meningitis, with cholesteatoma.....	8 " (6 m., 2 fem.)	= 3.2 %

Among the patients with caries of the temporal bone, but without sinus-thrombosis, 16 (11 males, 5 females), = 6.8 %, and among those with caries and thrombosis, 32 (22 males, 10 females), had succumbed to pyæmic processes.

4. PROFESSOR POLITZER.—**Contribution to the Operative Exposure of the Middle-Ear Cavities.**

The number of operations performed by POLITZER, at his clinic and in private practice, for exposure of the middle-ear cavities comprised 53 cases.

In 13 cases the middle-ear spaces were laid bare in patients in whom previously the typical operation according to Schwartze had been made by Politzer, and relapses had occurred with persistent suppuration.

In 8 cases, in addition to profuse offensive otorrhœa with granulations or cholesteatoma in the tympanic cavity, the mastoid process was painful, without swelling of the external integument; in 12 cases the painfulness was associated with swelling of the skin and of the periosteum of the mastoid. In 11 cases subperiosteal abscesses were found upon the mastoid, its walls being lined with granulations, and among these, in 7 cases, with a fistulous opening leading into the interior of the mastoid, and in 4 cases, without fistula.

Open fistulæ, with spontaneous perforation of the cortex, were found in 8 cases in the mastoid, and in 5 cases in the posterior and upper wall of the external meatus, through which the probe entered the antrum or a cavity in the mastoid filled with granulations.

Extreme stenosis of the external meatus by hyperostosis of the osseous portion, and hypertrophy of the lining of the external meatus, which could not be reduced, existed in 7 cases.

In 15 cases, in addition to the local pain in the ear or in the mastoid, headache, fever, occasional insomnia, vertigo, and nausea existed. Six cases with facial paralysis of long or short duration were operated, among which were 3 with tuberculous caries of the mastoid and of the tympanic cavity, with and without the formation of sequestra.

After description of the method of operation and its modification dependent upon the pathological changes in the temporal bone, Politzer reviews the changes found by him in exposing the middle-ear cavities.

In well-nigh one half of the cases, cholesteatomatous products were found in the tympanic cavity, antrum, and mastoid process. In 14 cases, he entered immediately below the cortex a spacious cavity in the mastoid with simultaneous carious and necrotic defects at the posterior and upper wall of the external meatus. The cavity was filled with discolored granulations, bone fragments, or dirty, cheesy masses. In 3 cases, the posterior and upper wall of the external osseous meatus was entirely missing; in 5 cases, the mastoid and the postero-superior wall of the canal were intensely sclerosed. The lateral sinus was laid bare to a varying extent in 4 cases by the suppurative process. In 3 cases, the dura mater was freely exposed, once above the mastoid antrum and twice above the tegmen tympani.

In the majority of cases, the antrum and walls of the tympanic cavity were diseased; malleus and incus in most cases defective. Politzer, therefore, during the last few years, operates mostly according to Küster's method. The typical opening, according to Schwartze, is advisable in cases with comparatively large hearing distance, which may be interfered with by the exposure of the middle-ear spaces and removal of malleus and incus.

Among the accidents during the operation, Politzer mentions intense hemorrhages from granulations and bone vessels or from an emissarium Santorini, which are readily stopped by plugging. In 1 case, the dura mater was laid bare without any consequences to the healing process. In 1 case, the horizontal portion of the facial nerve was injured by the sharp spoon scraping out the attic. This paresis of the facial disappeared in the course of several months. In 2 cases with facial paralysis before the

operation, the nerve recovered completely after the operation. The horizontal semicircular canal was not injured in any case.

Plastic procedures varied according to the anatomical relations of the special case. Most frequently the posterior cartilagino-membranous wall of the external meatus was divided in its entire length into two flaps, and, in order to gain a canal as wide as possible, one flap was sewed upward to the outer cutis, and the other downward. In several instances Koerner's flaps and also Thiersch's transplantations were used with good result. In cases with granulations in the middle ear and with small cholesteatomatous cavities in the antrum, Politzer permits the operated wound behind the auricle to close by cicatrization; in those with large cholesteatomatous cavities in the mastoid, it is necessary, on account of the better inspection of the focus of the disease, and of the possibility of better cleansing, to let the opening in the mastoid persist.

With reference to the final results of the operative exposure of the middle-ear cavities, Politzer believes, that the statements of various surgeons upon the cure of otorrhœa after this operation (50 to 75 %) are entirely too optimistic, since the duration of observation is, on the whole, still too brief, and some cases have been observed in which relapse of suppuration occurred after two and three years. Cholesteatomata relapse, as is well known, with but rare exceptions. The designation as radical operation, therefore, is, according to Politzer, not quite correct. Among the cases operated by Politzer, the suppuration has entirely ceased in 17 cases for a long period, while the remaining cases are still under observation. Secondary operations were performed in 7 cases. In 1 case, the external meatus was stenosed. While the duration of treatment is generally briefer than by typical opening of the mastoid, it still lasts several months. The hearing power was mostly somewhat improved by the operation, but rarely impaired. After this, as well as after the typical opening of the mastoid, the annoying symptoms from the head were relieved by the operation, and the general condition was improved. Exitus letalis was observed in 6 cases, viz.: in 3 cases with pyæmia, present previous to the operation; in 2 cases with chronic tuberculous otitis; and in 1 case with brain abscess, which had existed before the operation, but had not presented any symptoms.

5. PROFESSOR URBANTSCHITSCH. — **Contribution to the Operative Exposure of the Middle Ear.**

URBANTSCHITSCH has, during the last two years, performed the so-called radical operation of the middle ear in 72 cases. Among these were 47 cases with pure caries, 13 with carious and cholesteatomatous foci, and 12 cases with pure cholesteatoma.

In 42 cases the *mastoid antrum* did not present any marked alterations of its size; in 12 cases it appeared abnormally small, in 18 abnormally large, and among these were 5 with enormous enlargement posteriorly. The latter were cholesteatomata.

Urbantschitsch holds that the enlargement of the mastoid antrum reduces the size of the cavity of the skull.

Among the 72 cases the disease had extended in 9 cases to the *dura mater* (in 6 cases to the cerebellum, in 3 above the tegmen tympani). In 1 case, the *dura mater* above the tegmen tympani was perforated and *portions of brain* were prolapsed into the attic; this case completely recovered. Urbantschitsch mentions another case, in which the irrigated solutions contained upon their return brain matter, which, as seen during the operation, originated from the cerebellum. The portions had entered a large cholesteatomatous cavity of the mastoid process, which had penetrated into the external meatus; this case also recovered.

The *lateral sinus* was frequently found to be exposed; in 1 case, almost in its entire extent up to the transition into the *bulbus venæ jugularis*; in many cases the sinus was laid bare by operation. In 1 case Urbantschitsch found the sinus after opening without blood, but inferiorly thrombosed.

The *malleus* and *incus* were found as follows: Among the 72 cases the malleus was found normal 8, carious 62 times, twice missing; the incus normal 6, carious 63, missing 3 times; in 2 cases of caries an osseous adhesion of both ossicles was found.

The *facial nerve* was found before the operation in one case completely paralyzed, in several cases paretic. The paresis rapidly recovered after operation; the paralysis was greatly improved. During the operation facial paresis occurred in no case, but six times one or two days after operation with subsequent recovery; in 1 case the facial paresis of the upper lid became spastic.

Urbantschitsch then discusses the method of operation used by him and the after treatment.

Owing to the brevity of observation, which to the utmost

lasted two years, Urbantschitsch cannot make any definite statement with reference to the final results of the treatment, but only communicates the *course* of the cases up to date: Among the 72 cases, 28 heretofore resulted in a completely dry cavity, viz., 13 cases within 6 to 12 weeks, 8 within 3 to 4 months, 4 cases in 5 to 6 months, and 1 of each in 7, 12, and 16 months, respectively.

The operation markedly benefited the symptoms of *headache*, *vertigo*, *nausea*, etc., and the entire general health. Among the 72 cases, 42 had such symptoms, and one of them was a cholesteatoma with atrophy of the optic nerve and considerable contraction of the field of vision, which markedly improved after operation. Urbantschitsch, furthermore, emphasizes the beneficial influence of the operation upon psychic and nutritive disturbances, and also upon the *function of hearing* which was in some instances considerably improved (cp. Cases 2, 5, 7).

Urbantschitsch lays stress upon the fact, that frequently only by exposure of the middle-ear cavities, the extreme danger which threatens the life of the patient can be recognized.

6. Dr. FERDINAND ALT.—Apoplectiform Diseases of the Labyrinth in Caisson Laborers.

In caisson workers, exposed to pressures of 2.5 atmospheres, 3 cases of severe disease were observed. They occurred in 3 men who worked under over-pressure of from 2.2 to 2.4 atmospheres during the regulated time of four hours and then left the caisson feeling perfectly well. In one man, after an hour, in the other after 35 minutes, in the third after an hour and a half, the typical symptoms of morbus Ménière occurred, with well-nigh complete deafness, and so persistent and extreme vertigo, as rendering the patients unable to stand and necessitating their admission to Schroeter's clinic. In all three men extreme retraction and more or less marked livid discoloration of the drum-membrane with injection of the vessels of the malleus were seen; the result of the examination with tuning-forks had to be interpreted as a bilateral affection of the labyrinth. In two of the men there existed complete deafness in the left, in the third in the right ear, which persisted, while in the other ear slight traces of hearing power were preserved, which considerably improved in a few days.

ALT explains the later development of the severe affections, which do not occur in the caisson itself, but some time after leaving it, by fluctuations of the blood pressure, the curves of which he demonstrates. The causes of these cases are purely

mechanical, due to difference of pressure in the middle-ear and the surrounding cavities.

7. Dr. JOSEF POLLAK reports a case of **Perichondritis Septi Narium Serosa.**

In a man aged fifty-three complete obstruction of the nose had taken place without any apparent cause. The nasal entrance was filled with two pale red tumors. A swelling upon the dorsum nasalis, of the size of a hazel-nut, discharged, upon incision, serous fluid. After galvano-caustic extensive opening of one of the tumors, the cartilag quadrangularis was found to be perforated by a fissure.

POLLAK believes, that the affection is caused by degeneration of the cartilage, similar to othæmatoma.

8. Dr. GOMPERZ : **Typical Alterations of the Tension of the Membrana Tympani in Valvular Occlusions of the Eustachian Tubes.**

GOMPERZ draws attention to the bulgings of the *postero-superior quadrant* which are occasionally observed in an otherwise normal membrana tympani and intact apparatus of the tympanic cavity.

The patients exhibiting this anomaly have mostly slight disturbances, consisting in sensations of pressure, tension, slight subjective noises and occasional deafness.

The result of the examination with Siegle's otoscope is characteristic. The postero-superior portion promptly follows the compressions and rarefactions of the air in the external meatus, but immediately jerks into its former bulged position, even after the last movement has been a compression of air.

The patients state that even during the most precautions blowing of the nose, they feel the air striking against the membrana tympani.

There cannot, therefore, exist an impediment to its entrance into the tympanic cavity, but certainly one to its exit. In the cases, whose naso-pharynx had been examined, catarrh of this cavity, hypertrophy of the mucous membrane, polypi, and suppurations of the accessory sinuses were found.

Gomperz could remove this annoying abnormality by treatment of the naso-pharyngeal affection either alone, or together with catheterization and probing.

9. Dr. GOMPERZ : **Studies upon the Possibility of Closing Old Defects of the Membrana Tympani.**

Gomperz has subjected Okuneff's results to a critical parallel examination in trying the cauterization of the margins of a

number of chronic perforations of the membrana tympani with trichloracetic acid. The results were extremely gratifying, since in four among ten cases, after a few cauterizations, the defects cicatrized and even in one occupying the entire lower half of the drum membrane up to the periphery, while the size of the remaining six perforations considerably decreased. Gomperz cauterizes after application of a ten per cent. solution of cocaine with a thin probe, winding around the end a few threads of cotton impregnated with fluid trichloracetic acid.

The procedure is painful, but well borne. It can, of course, be applied only to cases in which by previous experiments with artificial drum membranes an impairment of hearing is not to be feared. The appearance of the cicatrized membrane is of particular interest to Gomperz : in place of the perforations a gray, firm, dull membrane had joined the remaining drum membrane without marked limits, which condition favors his former views of the simultaneous regeneration of the substantia propria in the cicatrization.

Gomperz does not believe that trichloracetic acid alone favors cicatrization. The brief duration of treatment accounts for the delay of the cure of the remaining six cases ; the other cured cases present considerable improvement of hearing, and in one the annoying subjective noises disappeared with the closing of the perforation after two years' duration.

10. DR. HAMMERSCHLAG : Respiratory and Pulsatory Movements of the Drum Membrane.

HAMMERSCHLAG made his investigations with an especial instrument devised by him similarly to that of Mach. He made about thirty observations upon four young normal-hearing individuals with the following results :

The membrana tympani exhibits constant movements coincident with the systole of the heart.

The membrana tympani moved during quiet respiration in all cases during the inspiration outwardly, during the expiration inwardly. During quiet respiration through the mouth these respiratory movements are less extensive.

Hammerschlag, therefore, arrives at the following conclusions :

The tympanic cavity openly communicates in the normal state with the naso-pharyngeal cavity.

The expiratory air current draws the air along from the tube

and the tympanic cavity according to the principle of the syphon, whereby the drum membrane is moved inwardly.

The inspiratory air current then enters the tympanic cavity so much easier, since it now represents a *locus minoris resistentiæ*. Hammerschlag considers Politzer's observations which are somewhat at variance with his own, as extremely suggestive of further more extensive investigations which may in future succeed in solving the still existing contradictions.

The pulsatory movements have before been explained by other authors through the reduction of the lumen of the tympanic cavity with each systole, whereby the drum membrane moves outwardly. Hammerschlag cannot add another proof to this entirely correct view.

REPORT ON THE FOURTH MEETING OF THE
DUTCH LARYNGO-RHINO-OTOLOGICAL SO-
CIETY, HELD AT UTRECHT, ON MAY 17, 1896.

BY PROFESSOR GUYE, OF AMSTERDAM.

Translated by Dr. MAX TOEPLITZ.

President : PROFESSOR GUYE.

1. Dr. HUYSMAN.—**Case of Perforations in Both Anterior Pillars of the Fauces.**

The patient, a young man, aged twenty, had suffered as a child from scarlet fever, with subsequent persistent bilateral chronic perforations of the drum membranes. HUYSMAN, nevertheless, considers the condition as a congenital anomaly, principally on account of the symmetrical position of both oval defects.

2. Dr. M. BOLT.—**Percussion of the Mastoid.**

In two cases of acute otitis media with delayed spontaneous perforation of the drum membrane and moderate inflammation of the mastoid region, BOLT found, in percussion, marked dulness, thereupon indicating the mastoid operation, which was not permitted. After paracentesis of the membrana tympani, both cases completely recovered without further operation.

3. Professor GUYE.—**Demonstration of a Case of Radical Operation on Account of Cholesteatoma.**

The patient, a school-teacher, aged thirty-nine, was, twenty years ago, in 1875, treated by GUYE for purulent otitis media with polypi and abscess over the mastoid process. In 1888, the patient stated, that after six years of perfect health, he had twice subjected himself, on account of headaches and neurasthenia, to cold-water treatment without improvement, but now again suffered from earache and otorrhœa. Some granulations and offen-

sive cheesy pus were removed from the tympanic cavity and antrum. Irrigations were made through the tympanic cavity from the Eustachian tube. After several repetitions of this treatment, the patient remained perfectly well for one year. He returned in 1889 and 1890 with slight relapses, remained very well from 1890 until 1896, syringing the ear once a month with a 1:000 solution of sublimate, and had all this time neither earaches nor otorrhœa. On March 21, 1896, he returned with pain and otorrhœa. After removal of a large amount of epidermis, a spontaneous perforation was found in the posterior wall of the external meatus, from which many pieces of epidermis were removed. Three weeks later the patient returned after an attack of influenza, with renewed pain and swelling of the mastoid. On April 18th, an abscess was found above the external meatus. On the following day the operation took place. Guye found a very large antrum, filled with pus and cholesteatomatous masses. After their removal, air bubbles could, upon Valsalva's experiment, be seen to come out of the aditus ad antrum. Guye resolved to make a permanent opening, and introduced, three days after the operation, a rubber drainage tube, 12 mm in thickness and 3 cm long, cut off in such a way as to make it at two places extend to the posterior wall of the antrum; in addition, he placed a strip of iodoformed gauze through the opening in the posterior wall of the external meatus, leading it through the outer opening in the mastoid. He thus intended to keep this spontaneous perforation, which was still more enlarged during the operation, permanently open. The drainage tube, of course, was shortened after a few days to 2 cm. The patient is still able to blow the air through both openings. Guye will let the canal cuticize, and, after a few months, replace the drainage tube by a loose plug of iodoformed gauze, and keep the canal as dry as possible. Four years ago, Guye had presented before this society a patient operated by him according to the same method, who has had for eight years these two permanent openings without a trace of relapse. He now and then expresses the desire of having the opening closed, which I do not, of course, grant, because it would sooner or later create a relapse.

4. Dr. MOLL.—A Case of Chiselling of the Mastoid.

The patient, a man aged thirty, had suffered in his childhood from otorrhœa, and, for two years, from violent headache. There existed some otorrhœa and swelling of the mastoid. MOLL

opened the mastoid by chiselling, removed a great amount of cheesy pus, and transplanted the outer skin in order to keep the wound open. At the bottom of the wound, an osseous bridge, below which a probe can be passed, impresses us as a semi-circular canal, but neither Dr. MOLL nor any one of the other aurists present believe it. The headaches have disappeared, and the general condition of the patient is satisfactory.

5. Dr. REINHARD (of Duisburg, as guest of the society). Presentation of a patient with **Deep-Seated Cervical Abscess Following Otitis Media Purulenta.**

The peculiar feature was the development of the abscess after the otitis media had taken its course. There existed a very large and hard infiltration, non-fluctuating and extending to the clavicle and manubrium sterni. On March 25th the mastoid process was chiselled and found to contain in the planum mastoideum a perforation, the size of a pea, from which yellow non-offensive pus was discharged. The burrowing abscess was incised and drained on April 10th and again on the 23d. There still exists posteriorly a hard infiltration, and granulations at the bottom.

Dr. TEN LEITHOFF asks, whether the pus has been microscopically examined. The hard infiltration extending from the mastoid process to the clavicle leads him to the supposition of the presence of actinomyces. A year ago he had located a similar case in which the hard infiltration and the absence of fluctuation led him to the diagnosis of actinomyces, which he really found as granules in the pus and cured in a few weeks with iodide of potassium in doses of 2 grammes per diem.

(In the course of the meeting TEN LEITHOFF with permission of REINHARD examined the pus taken from the wound and demonstrated to the members the clubs and threads of actinomyces, which were considered to be proven as such by several aurists. REINHARD states that the diagnosis of actinomyces appeared to him quite probable but not absolutely established.)

6. Dr. W. VAN DER HEIDE. Demonstration of **Choanal Polypi and Foreign Bodies.**

VAN DER HEIDE presents four large choanal polypi which had been removed with the cold snare. One was a cysto-fibroma; three were removed through the nose, one through the mouth, after the thin pedicle had been severed by the snare.

He also demonstrated a revolver bullet which had been shot by a suicide into the inner canthus. The bullet could neither be

found in the wound, nor in the abscess of the inner canthus. After a few weeks the left nostril was obstructed by offensive discharge. In introducing a probe between the middle turbinal and septum, Van der Heide felt a foreign body, which when extracted with curved forceps proved to be the extremely disfigured bullet. A few days later an osseous sequestrum was removed.

Van der Heide furthermore exhibited a centipede, which, five years ago, had during sleep crawled into a boy's nose. The patient suffered from headache and itching in the nose. A week after the removal of adenoid vegetations, the patient returned with a mucous mass, which had been removed a few days after the operation, by nasal irrigations, and presented lively movements. After cleaning, it proved to be an insect which was determined by Dr. P. P. C. Hoek as *anthronomalus similis*.

7. Dr. A. SIKKEL. Demonstration of **Plaster of Paris Casts of the Upper Jaws in Adenoid Vegetations.**

These casts present the peculiar changes to which in 1891 Koerner drew attention, and which differ according to Sikkel according to the development of the nasal obstructions during the first or second dentition. In the first case, the hard palate is high, the entire upper jaw not well developed, the transverse diameter shortened, the longitudinal prolonged. In the second case, the following changes are added: The hard palate is still higher, the alveolar processes are nearer together, and the jaw is apparently laterally compressed. There exists a sharp bend in the median line, the two median incisors are placed at an angle and turn the lingual surfaces toward one another. The lateral incisors also seem to suffer from the nasal obstruction; in some cases, one is atrophied and the other entirely missing. It would be advisable for dentists to pay attention to the fact, that the crooked and irregular growth of teeth is frequently due to changes in the upper jaw caused by nasal obstruction.

8. Dr. H. BURGER. Demonstration of a case of **Radical Operation with Persistent Opening on Account of Cholesteatoma.**

The patient, a man, aged twenty-seven, came, four years ago, under observation with offensive discharge from the right ear, of fourteen years' duration, frequent vertigo, and headache. After the removal of a large amount of cholesteatomatous masses, a portion of the upper and posterior wall of the external meatus was

seen to be missing, a defect which led into a large cavity in the mastoid process, containing many offensive masses, which were removed. After cessation of headache and vertigo, the patient escaped further treatment, but returned three years later, in December, 1895, with the complaint, that during the last six months headache and vertiginous attacks had reappeared, and once even with loss of consciousness, diplopia, and convulsions. The patient, on December 24, 1895, was operated in narcosis, with removal of the remaining osseous posterior wall of the external meatus and the formation of a cutaneous flap according to Stacke-Jansen. On March 5, 1896, the cavity in the mastoid process was entirely cutized without a trace of secretion. The general health, appearance, and memory, which had been very poor during the last year, were much improved, and also the hearing for whispered voice had increased from 0.50 metres to 2.50 metres.

REINHARD is struck with the complete occlusion of the tube, which, according to Burger's statement, has not been intentionally effected. He has frequently tried during operation to produce the occlusion either by curetting or cauterization, but always to no purpose. He considers this occlusion as a very fortunate feature.

GUYE believes it to be advantageous, if the tube remains open, for the normal ventilation of the tympanic cavity.

BURGER, in accordance with Reinhard, considers the occlusion as an advantage principally in cholesteatoma, in which relapses frequently take place by inflammatory irritation from the tube. The ventilation through the tube is of no service after the radical operation, when membrana tympani and posterior wall of external meatus are absent.

M. BOLT. Treatment of Chronic Purulent Otitis Media with Styron.

Bolt used a 5-per-cent. alcoholic solution of styron (recommended by Spalding), and was very well satisfied with its action. Styron is a mixture of equal parts of styrax and Peru-balsam.

REPORT ON THE PROGRESS OF OTOLOGY DURING THE SECOND QUARTER OF THE YEAR 1896.

BY DR. ARTHUR HARTMANN, BERLIN.

Translated by Dr. C. ZIMMERMANN, Milwaukee, Wis.

A.—ANATOMY.

a.—EAR.

134. BRIEGER, OSCAR. Clinical contributions to otology. Wiesbaden, J. F. Bergmann.

135. GARNAULT, P., Paris. May, from formations of the skull, conclusions be drawn as to anatomical conditions presenting more or less danger in operations on the temporal bone? Paris, A. Maloine, 1896.

136. SCHUELZKE. On the topographic anatomy of the ear in regard to the formation of the skull. *Arch. f. Ohrenheilk.*, vol. xl, Nos. 3 and 4.

137. RAMÓN Y CAJAL, S. Contributions to the study of the medulla oblongata, the cerebellum, and the origin of the cranial nerves. German edition, with additions by the author, by Johannes Bresler. With a preface by E. Mendel. Leipzig, 1896, Joh. Ambr. Barth.

138. MEYER, S. On a fashion of connection of the neurons; with communications on the technique and the results of the method of subcutaneous injections of methylene blue. *Arch. f. mikrosk. Anat. und Entwicklungsgeschichte*, vol. xlvii, 1896.

139. DOWNIE, WALKER. A case of congenital malformation of the ears. *The Practitioner*, March, 1896.

140. TALBOT, EUGEN S. The degenerated ear. *Amer. Med. Assoc.*, Jan. 18, 1896.

141. ALEXANDER, GUSTAV, WIEN. Contribution to the macroscopical dissection of the human labyrinth. (From the anatomical institute of Professor Zuckerkandl.) *Arch. f. Anat. und Physiologie*, 1893. Anat. Abth.

134. During the years 1892-94, BRIEGER observed 11 cases of malformation of the external ear, of which 5 presented microtia, which occurred on both sides in 3 cases; atresia of the external auditory canal in 2 cases; the auricle was pretty normally developed. Bilateral microtia is not very rare, according to Brieger. In all cases of unilateral microtia there was marked asymmetry of the face. In one case the auditory canal was divided into an upper portion extending to the *Mt*, and a lower one, ending blind. Auricular appendages occurred frequently; excessive growth of the auricle only once.

135. Koerner's researches in regard to the lower level of the middle cranial fossa and the more anterior portion of the sinus in brachycephalous skulls were repeated by GARNULT, but not, as Garnault thinks, with contradictory results. Garnault measured 60 skulls stereographically, according to Broca's method—27 dolichocephalous, 26 brachycephalous, 7 mesaticephalous. As to the relation of the linea temporalis to the middle cranial fossa, so many variations occurred, independent of the external configuration of the skull, that the linea temporalis has no diagnostic value. Without exception, its position was lower in females. In brachycephalous skulls the middle cranial fossa is, in the average, lower than the linea temporalis and the horizontal tangent. This corroborates Koerner's assertions. Garnault, however, is of opinion that the variations are too small, of irregular graduations, and mostly dependent upon individual relations, so that they do not admit of formulating a general law. Garnault avers the same in regard to the topography of the lateral sinus. The left sinus was constantly found farther back, 1.55 mm at an average. At the most, it might be inferred that the right sinus in the brachycephalous advanced minimally, but in regular progression. Often such an advancement of the sinus was found when the mastoid process was little developed and diploic or compact (Politzer). Garnault's assertions culminate in the admonition to consider every petrous bone, especially that of the right side, as dangerous in regard to operations.

G. ZIMMERMANN.

136. SCHUELZKE criticises the methods of Koerner (described in *Archiv f. Ohrenh.*, vol. xxiv., and these ARCHIVES, German edition, vols. xviii, 310 ; xvi., 281, and xxi., 431), and tries to prove the wrong in Koerner's conclusions by means of tables compiled by Koerner, Randall, Garnault, and himself. He concludes that there are no external signs of the so-called dangerous petrous bones, "since the level of the middle cranial fossa and the advancement of the sinus are not dependent upon anthropological types." The floor of the middle cranial fossa of each side is not at the same level, and the right sinus generally penetrates farther into the bone and produces more frequently the dangerous form than the left.

KRAUSE.

137. In a very elaborate monograph the well known Spanish author collects his recent researches on the medulla oblongata by means of his silver chromate method. He confirms the recent investigations of Koelliker, von Lenhossek, and Held, in regard to the origin of the vestibular and cochlear nerves. A minute description is given of the bifurcation of the vestibular fibres and of the nucleus of Deiters, of Bechterew, and the dorsal nucleus. RAMÓN Y CAJAL discovered a new acoustic focus in front of the convexity of the upper olive, and called it nucleus semilunaris sive præolivaris externus. The terminal fibres in the nucleus of the corpus trapezoides, discovered by Held, are described in detail by Ramón y Cajal. In opposition to Held's opinion, they represent either direct acoustic fibres or nervous processes of the ventral nucleus.

KRAUSE.

138. MEYER also succeeded in obtaining those terminal fibres in the nucleus trapezoides with the method of subcutaneous injections of methylene blue and the slow method of Golgi, but they give pictures different from those of Ramón y Cajal and Held. The generally pretty thick fibre spreads its several branches into numerous round or oblong swellings encircling very closely the body of the ganglion cell. The reporter found the same pictures in numerous similar experiments, and corroborates the results obtained by Meyer. This object shows most decidedly the superiority of the staining method with methylene blue over that of Golgi.

KRAUSE.

139. In DOWNIE'S case the right auricle was fully developed, but springing from the site of the tragus was another miniature auricle with its helix directed forwards, consisting of skin and fat, with a small portion of cartilage on its inner aspect, a deep

depression being present in front. The meatus was slit-like, the membrane normal. The left auricle was represented by a mass of soft tissue, irregular in shape, and deficient in cartilage; the helix represented by two curves as if the posterior border at its most prominent part had been pushed forward; the concha merely a linear depression, and at the upper part of that which represented the lobule was a small circular depression confined to the skin only. No sign of meatus to be detected. The mouth was kept widely open, the lower lip presenting a V-shaped outline. Under the tongue a large mass of tissue was present which interfered with deglutition and respiration. The child died about six weeks old of exhaustion, and at the post-mortem examination no sign of a meatus could be found on the left side, the bone being rounded in front, with absence of the zygomatic process. Lying between the skin and bone was a pad of what looked like embryonic tissue. A complete examination was not allowed.

CHEATLE.

140. The writer says that "comparison of the length and width of the ears of paupers, criminals, and the insane indicate that degenerates possessed much the largest and widest ears." He gives a table, in which it is shown that the percentage of deformities of criminals and insane is nearly the same, and, taken together, is about one half as great as the normal. In an examination of 1000 normal persons—92 per cent. were found to have attached lobules, while among the insane only 47 per cent. were found, showing that the former theory was not correct, viz., "that persons whose lobule is attached its entire length have insane tendencies." The tables show that the tubercle of Darwin is not always found at the upper part of the middle third of the helix. Tubercles practically identical may be found at any point on its border. These tubercles are obviously similar in appearance, and due to the same causes that produce the tubercle of Darwin (arrest, and excessive development of the helix). There is a larger percentage among normal individuals than with the degenerate class. The left ear seems to be least affected in either the normal or the degenerate. The ear at 90 degrees is said to be a marked sign of degeneracy, yet the figures do not bear out this claim.

GORHAM BACON.

141. After discussing the usual methods for dissection of the labyrinth, ALEXANDER describes his methods of decalcination and hardening. He recommends chiefly the method with chromic

and hydrochloric acids on account of its short duration and cheapness, the certainty of complete decalcination, and the marked differentiation of colors. The details have to be read in the original. The author makes systematic anatomical preparations for the demonstration of various portions of the labyrinth (*e. g.*, a semicircular canal or utriculus vestibuli), which he leaves in connection with the bone for orientation. Also topographic anatomical preparations of the membranous labyrinth of the upper or posterior surface of the petrous bone, or the fenestra vestibularis and the three semicircular canals with the oval utriculus. The illustrations show very well the value of these preparations.

WALTER HAENEL.

b.—NOSE AND PHARYNX.

142. DUNCAN W. and DAWREN A. Case of congenital absence of nose, right palpebral fissure, right ear, etc. *Trans. Gyn. Society of London*, v., 37, p. 16.

143. LIEBE, G. Congenital atresia of the nostrils. *Monatschrift f. Ohrenheilkunde*, Jahrg. xxx., 4.

144. DOWNIE, WALKER. Congenital membranous occlusion of left nostril. *Brit. Med. Jour.*, May 16, 1896.

145. KILLIAN, G. On the anatomy of the nose of human embryos. *Arch. f. Laryng. and Rhin.*, vol. iv., No. 1.

146. SEYDEL, O. On the nasal cavity and Jacobson's organ in amphibia. *Morphol. Jahrbuch*, vol. xxiii., No. 4.

142. DUNCAN reports a total osseous atresia of the right choana of a girl *æt.* nine, with homonymous paresis of the muscles of the face, which he attributes to inactivity of the muscles effecting nasal respiration.

KRUASE.

143. A case of congenital partial occlusion of the nostrils of a patient, aged eighteen, who had suffered from a high degree of rachitis in childhood. Each nostril presents a funnel-shaped cavity with an opening at the apex of the size of a pin's head. The obstruction is membranous. Position of teeth abnormal. The upper row of teeth recedes behind the lower. LIEBE attributes the maxillary, deformation to the wanting nasal respiration.

KRAUSE.

144. At the Glasgow Medico-Chirurgical Society, May 8th. DOWNIE showed a child aged twelve months with a membrane stretching across and occluding the left nostril.

145. In the second part of his voluminous work KILLIAN describes in detail the cartilages and bones of the lateral ethmoidal region according to Born's method. He reaches the conclusion, that the cartilaginous and osseous turbinated bodies belong to the same type of architecture and are to be considered as lamellæ, save the ascending process of the first concha. Their size decreases in a ventro-dorsal direction and one covers the other like shingles. The second chief turbinated body shows this type best. It originates from the middle portion of the lamina papyracea, and from a medial aspect presents an ascending and descending portion. The former is attached to the corresponding portion of the next concha by secondary union. The additional conchæ are built in the same fashion, only in smaller proportions, so that the whole ethmoidal region may be considered as a large lamella of the lateral lamella, from which numerous small lamellæ arise in regular arrangement. The ascending branches of the six sulci, always present at first, close up later; the fifth and sixth obliterate, and from the others various combinations may result.

KRAUSE.

146. The amphibia are the lowest animals with the organ of Jacobson. SEYDEL examined it in some amphibia, in order to study its phylogenesis. It is to be considered as a differentiation of the nasal cavity and contains real sense-epithelium, provided by the olfactory nerve. It originates in a semicanalicular depression of the olfactory mucous membrane, which develops into different formations by separation, transportation, and extension to a cul-de-sac. Numerous well developed glands empty their secretion into this organ, which has the function to transmit the excitation of the nervous terminal organs and to remove foreign bodies from the diverticulum. A maxillary cavity analogous to that of the mammals is wanting in amphibia.

KRAUSE.

B.—PHYSIOLOGY.

147. EPSTEIN, S. On the modification of visual perceptions under the influence of simultaneous acoustic impressions. *Zeitschr. f. Biol.*, xxxiii., N. F., B. xv., 1896. p. 28.

148. GELLÉ. "Audition," *Dictionary of Physiology*, by Charles Richet, Paris, 1895.

147. EPSTEIN's paper is the first attempt to oppose the speculations on colored audition by experiments. He examined the increase of vision under the influence of simultaneous acoustic

impressions. The arrangement of the experiment carefully excluded many sources of error. The chief result of the 164 experiments was, that in 60 % the acoustic impressions acted not only on the modification of vision, but also on the color sense, in the remaining 40 % only on vision. He explains this by the assumption, that the acoustic excitation reaching the anterior corpora quadrigemina is reflected to those optic fibres which conduct in a centrifugal direction, so that the retina becomes more sensitive for visual perceptions. ASHER (Bern).

148. GELLÉ gives in his extensive work (83 pages), not only a complete description of the physiology of the hearing organ, but also a very minute anatomical sketch with many illustrations, including embryology and comparative anatomy.

C.—PATHOLOGY AND THERAPEUTICS.

MISCELLANEOUS.

149. Report on Gruber's polyclinic in 1895. *Monatsschr. f. Ohrenheilk.*, 1896, Nos. 4, 5, and 6.

150. NICOLAI e DELLA VEDOVA. Statistics and clinical considerations on laryngo-otology in 1896. Milano, 1895.

151. OTTOLENGHI. The condition of hereditary deaf-mutes in biology and in law. *Arch. italiano di Otologia*, etc., 1896. fasc. I., p. 1.

152. SUCHANNEK, H. On scrofulosis ; its pathology and relation to latent tuberculosis of the tonsils, cervical glands, and vicinity. *M. Bresgen's Sammlung zwangloser Abhandlungen*, etc., Halle, 1896, vol. i., No. 11.

153. HAGEDORN, M. On the relation of general diseases and affections of the nose and throat to the hearing organ. *M. Bresgen's Sammlung*, etc., vol. i., No. 10.

149. The report contains tables of all cases and the histories of the following : Malformation of the auricle, foreign bodies in the external meatus, otitis externa, eczema of the auricle, othæmatoma ; ruptures of *Mt*, sarcoma of the ear, otitis media hyperplastica ; chronic otitis media with caries of the mastoid process, pyæmia, inflammation of the wall of the sinus transversus and extradural abscess, operation, recovery ; 2 cases of opening of the mastoid process, speedy recovery by secondary suture.

G. KILLIAN.

150. NIKOLAI and DELLA VEDOVA, give statistics on 4393 patients: 1748 affections of the nose, 504 of the ear, 1008 of pharynx, 489 of larynx, 412 of throat, 32 of œsophagus. Each chapter contains a clinical summary of the more important diseases.

GRADENIGO.

151. OTTOLENGHI reports investigations on deaf-mutism from biological and legal standpoints. He collected the views held by various codes, describes the anthropological characteristics according to his own observations, the various symptoms of sensibility, the mental development of deaf-mutes, and comes to the conclusion that the latter, save that of deaf-mute cretins, is not much inferior to that of normal individuals. Legally the deaf-mute has the same rights as any other citizen. Each case has to be individualized, and the regulations in regard to persons with mental defects have also to be extended to deaf-mutes.

GRADENIGO.

152. SUCHANNEK's results may be thus formulated: Scrofulosis is tuberculosis and tubercle bacilli may be latent in the tonsils like anywhere else.

BLOCH.

INSTRUMENTS AND METHODS OF EXAMINATION.

154. FERRERI. Gymnastics of the *Mt* and ossicles. Description of a new apparatus. *Arch. italiano di Otolog.*, iv., 1896, p. 153.

155. COURTADE. Irrigation of the tympanic cavity with a new canula. *Ann. des mal. de l'oreille*, May, 1896.

156. EITELBERG, A., Vienna. On some accidents in catheterism and in introducing bougies into the Eustachian tube. *Wien. med. Presse*, No. 26, 1896.

157. OHLS, HENRY G. A simple method of transillumination. *Journ. Amer. Med. Assoc.*, June 13, 1896.

158. SCHWARTZ, WM., Rostock. On the value of electric transillumination of the cavities of the human body. *Beiträge für klin. Chirurgie*, vol. xiv., p. 615.

159. GIBB, JOSEPH P. A septal pin. *Phila. Polyclinic*, April 18, 1896.

160. KOHN, SAMUEL. Upon the importance of digital examination in the diagnosis and treatment of diseases of the throat and nose. *Medical Record*, April 18, 1896.

161. **BERGEAT**, H., München. On the visibility of the upper turbinated body in non-atrophic nasal cavities. *Monatsschr. f. Ohrenheilk.*, No. 6, 1896.

154. The instrument, described and illustrated by **FERRERI**, is for slow massage of *Mt* (not more than thirty vibrations per minute). It may be employed by the patient without danger for the sound-conducting apparatus, since the pressure used does not exceed 24 *cm*.

GRADENIGO.

155. **COURTADE**'s tympanic canula forms an angle with the handle, but there it is straight and has, next to its terminal opening, two lateral holes.

ZIMMERMANN.

156. **EITELBERG** observed intense submucous emphysema after a lesion of the mucous membrane by introducing a bougie into the Eustachian tube. It spread over the corresponding side of neck down to the chest and up to the cheek and forehead. In another case a celluloid bougie had remained in the isthmus of the tube, and after forced extraction the button was missing. No reaction, and as other bougies could be introduced without trouble, Eitelberg thinks that the button had been thrown out by reflex sneezing.

POLLAK.

157. **OHLS** uses an ordinary cautery electrode guarded by a two-drachm vial, which is held by the neck with the patient's lips, the cork preventing the light to escape. By covering the vial with opaque paper except at the end, it can be used for transillumination of the frontal sinus.

M. TOEPLITZ.

158. According to **SCHWARTZ** the transillumination of the frontal sinus from the orbit is very valuable for diagnostic purposes, since the absorption of light by pus is so intense, that the transillumination will yield a negative result even with small quantities of pus (*contra Ziem*). The absence of the frontal sinus, which might be misleading, is very rare. No observations of his own. He thinks that his method of transilluminating each maxillary sinus from its inferior (palatal) wall is much more reliable than the former methods. Only in 20 per cent. of his cases with normal maxillary sinus the pupil was illuminated. Therefore he considers this phenomenon as unimportant. The result of transillumination will be negative in empyema, hematoma, sarcoma, carcinoma, enchondroma, and osteoma of the sinus.

WALTER HAENEL.

159. In **Roberts's** operation for deflected septum, which consists in loosening the septum from its attachment at the floor of

the nose by an incision, with or without oval excision of redundant cartilage, and subsequent fixation by means of a pin, which is inserted like one to a buttonhole bouquet, GIBB devised a special round pin constructed from one piece of metal, with a bulbous end, the length of the pin varying from three-quarters to two and a half inches.

TOEPLITZ.

160. Palpation exercised with a thoroughly aseptic finger is valuable in establishing the diagnosis in adenoids, malignant disease, follicular tonsillitis, suppurative tonsillitis, peritonsillar abscess, and foreign bodies. It acts as a guide in intubation, dislodges rhinoliths, and helps to replace the fractured septum in Asch's operation.

TOEPLITZ.

161. In some few cases the upper turbinated body can be seen by anterior rhinoscopy, as BERGEAT shows on preparations and by observations in the living.

KILLIAN.

EXTERNAL EAR.

162. EITELBERG, A., Vienna. Otiatric communications. *Wien. med. Presse*, No. 17, 1896.

163. RICHARDSON, C. W., Washington. A case of living maggots in the normal meatus. *These ARCHIVES*, Germ. Ed., xxviii., p. 292.

164. MIOT. On artificial permanent perforations. *Rev. hebdom. de laryng.*, etc., No. 26, 1896.

162. EITELBERG saw in two cases perforation of abscesses of the lower lobe of the parotis through the inferior wall of the auditory canal, and quite frequently circumscribed otitis externa produced by accumulations of cerumen.

POLLAK.

164. MIOT dissects the posterior and then the anterior periphery of *Mt*, leaving a bridge at the lower border. After this is also cut, the manubrium with the *Mt* is removed. He obtained a permanent perforation in twenty out of twenty-four such operations. M. advocates this procedure in dry aural catarrh, when the paracentesis improves the hearing power. The results were very inconstant.

ZIMMERMANN.

MIDDLE EAR.

165. EITELBERG, A., Vienna. Contributions to facial paralysis in non-purulent ear affections with Ménière's symptoms. *Wien. med. Woch.*, No. 27, 1896.

166. ZWAARDEMAKER, H., Utrecht. An initial symptom of sclerosis. *Zeitsch. f. Ohr.*, vol. xxviii., p. 119.
167. LANNOIS. Normal middle ear and microbes. *Ann. des mal. de l'oreille*, etc., No. 5, 1896.
168. LANNOIS. Acute middle-ear catarrh and microbes. *Ann. des mal. de l'oreille*, etc., No. 6, 1896.
169. BERNSTEIN, E. J. Treatment of chronic otitis media. *Maryland Med. Journal*, June 13, 1896.
170. SPEAR, EDMUND D. The relation of the thyroid gland to certain diseases of the ear, with a theory of its function. *Boston City Hospital Med. and Surg. Reports*, 1896.
171. PODACK, Max, Koenigsberg. On the relation of croup after measles and the affections of the middle ear following diphtheria to the diphtheria bacillus of Klebs-Loeffler. From the medical university clinic of Prof. Lichtheim. *Deutsches Archiv f. klin. Medicin*, vol. lvi., p. 34.
172. MOURE. Observation of an angiomatous polypus. *Rev. de laryng.*, d'otol., etc., Dec., 1895.
173. BISHOP, S. S. Gangrene of the ear. *Four. Amer. Med. Assoc.*, March 28, 1896.
174. MARSH, F. A case of cholesteatoma of mastoid. *Brit. Med. Fourn.*, April 25, 1896.
175. FARACI. Surgery of the middle ear, and critical examination of the consequences of operations on the attic in regard to the hearing power. *Palotta Edit.*, Rome, 1895.
176. BRONNER, ADOLPH. The symptoms and treatment of diseases of the attic. *Lancet*, June 6, 1896.
177. JONES, H. E. Present position of radical operations for chronic suppurative otitis. *Brit. Med. Fourn.*, May 30, 1896.
178. LICHTENBERG, KORNEL, Budapest. On suppurations of the attic in a case of otorrhœa of thirty-three years' standing; cured by operation. *Wien. med. Wochenschr.*, No. 25, 1896.
179. HAMON DU FOUGERAY. Study on the different methods of treatment of chronic purulent otitis media. *Ann. des mal. de l'or.*, etc., No. 6, 1896.
180. BRUNNER, CONRAD, Muensterlingen. On the pathogenic action of the bacillus of Friedlaender. A case of acute metastatic general infection after otitis media and empyema of the mastoid process.

181. MOURE. On some anomalies of the mastoid region. *Rev. hébdom. de laryng.*, No. 24.

182. TOTI. On radical surgery in chronic suppuration of the middle ear in relation to pathology. *Il Policlinico*, ii., No. 17.

183. LUBET-BARBON. Empyema of the mastoid with suppuration of the tympanic cavity. *Arch. intern. de laryng. d'otol.*, No. 3, 1896.

184. VEIHER. Three cases of otitis media with mastoid complications cured without surgical intervention. *Ann. des mal. d'or.*, June, 1896.

185. SHEPPARD, J. E. Two cases of acute mastoiditis in persons suffering from diabetes mellitus. *Med. News*, May 2, 1896.

186. KOERNER, Rostock. A new contribution to aural and mastoid suppurations in diabetes, with remarks on the percussion of the mastoid process. These ARCHIVES, German Edition, vol. xxviii., p. 285.

187. SZENES, SIGISM., Budapest. Is a conservative or radical treatment indicated in acute cases of mastoid diseases? *Wien. allg. med. Zeitung*, No. 25, vol. xxvi., 1896.

188. GRADENIGO. Contribution to the pathology and surgery of the mastoid process. *Archivio ital. di Otol.*, p. 341, 1896.

189. CHEATLE, ARTHUR H. A case of middle-ear suppuration; mastoiditis; death from rupture of the œsophagus. *Pediatrics*, April 15, 1896.

190. COZZOLINO. A new method of radical opening of the mastoid process. *Bollettino delle mal. dell'orecchio*, etc., March, 1896.

191. REDMER, C., Danzig. On spontaneous healing of cholesteatoma, or affections similar to cholesteatoma, of the cavities of the petrous bone. From the ear clinic of Rostock. These ARCHIVES, vol. xxv.

192. GRUNERT. Contribution to the operative exposure of the cavities of the middle ear. *Archiv f. Ohrenheilk.*, vol. xl., p. 188.

193. LANNOIS and JABOULAY. Hemianopia in otitic brain abscess. *Rev. hébd. de laryng.*, etc., No. 23, 1896.

194. OPPENHEIMER, H., Berlin. On the character of aphasia in otitic abscess of the left temporal lobe. *Fortschritte der Medizin*, xiii., p. 378.

195. POULSEN, KR., Copenhagen. On cerebral affections in otitis media. *Arch. f. klin. Chirurgie*, vol. lii., p. 415.

196. KRETSCHMANN, Magdeburg. A case of serous meningitis cured by operation. *Muench. med. Wochenschr.*, No. 16, 1896.

197. LICHTENBERG, KORNEL., Budapest. Cases of otitic intracranial complications. *Wiener med. Presse*, No. 19, 1896.

198. SCHMIEGELOW, E., Copenhagen. Intracranial complication in the course of purulent otitis media; trephining; recovery. *Zeitsch. f. Ohr.*, vol. xxviii., p. 135.

199. OLIVER, J. C. Cerebral surgery. *Four. Amer. Med. Assoc.*, May 30, 1896.

200. HUBBELL, A. A. Report of a case of otitic brain abscess, with remarks on diagnosis. *Buffalo Med. Fourn.*, May, 1896.

201. SWAIN, HENRY L. Cerebral disease following otitis media purulenta chronica, with a case. *Yale Med. Fourn.*, Jan., 1896.

202. URQUHART, R. A. Two cases of abscess in the mastoid region associated with diabetes mellitus. *Med. News.*, March 21, 1896.

203. DAHLGREN, CARL, Upsala. Three cases of thrombosis of the sinus transversus after otitis media; operation; recovery. *Arch. f. klin. Chirurgie*, vol. lii., p. 608.

204. VENTRINI. On infectious thrombosis of the intracranial venous sinus. *Il Policlinico*, ii., 11, Nov., 1895.

205. HAUG, R. On exudations in the attic in influenza, with report of a case of thrombosis of the sinus, cured by operation, and two interesting post-mortem examinations. *Arch. f. Ohrenheilk.*, vol. xl., p. 161.

165. The patient, æt. thirty-five, fell from a horse, and struck his head on the hard soil. Immediately vertigo, vomiting, tinnitus and hardness of hearing in left ear. Four days later the examination revealed: Traumatic perforation of Shrapnell's membrane with ecchymosed borders, on the seventh day paralysis of the facial nerve. Complete recovery after two months' treatment. In another case, tinnitus and vertigo without impairment of hearing followed an energetic mopping of the pharynx with a 10 % solution of nitrate of silver; after ten months, paralysis of the right facial nerve, still persisting for one year and a quarter. Eitelberg does not understand the pathogenesis in either case.

POLLAK.

167. Pieces of the mucous membrane of the tympanic cavity of several rabbits and of four dogs or the ossicles were removed in a sterile condition and used for culture experiments. The bouillon remained sterile as long as a secondary infection could be excluded. LANNOIS attributes this asepsis of the tympanic cavity to the faculty of the nasal mucous membrane to retain and destroy germs which may have entered, and to the possibility that the mucous membranes of the tympanic cavity and the nose have bactericidal properties.

ZIMMERMANN.

168. LANNOIS found the exudation evacuated by paracentesis, in 6 cases of middle-ear catarrh, sterile in 7 out of 12 cultures. This agrees with the theory (in Lannois's opinion) derived from experiments on animals, and Lannois thinks that there will be less micro-organisms in an exudation of longer duration, upon which the bactericidal properties of the mucous membrane have more time to act than in one of more recent origin.

ZIMMERMANN.

169. BERNSTEIN says in his paper that, after looking into the direct and indirect causes in each case, the catarrhal inflammation of the Eustachian tube must also be treated locally. The Eustachian catheter, bougie, and Eustachian syringe, with the Politzer bag, are necessary. Injections into the middle ear are of service in some cases, as well as massage of the ankylosed ossicles, either by a cotton-tipped probe resting on the short process and worked by hand, or by some of the electric vibrators. He finds the vibrometer worthless. In regard to excision of the ossicles, the author says: "I have tried it in a number of cases, and shall not do so any more, my patients having lost what little hearing they had, though for a time there was marked improvement."

GORHAM BACON.

170. SPEAR gives a résumé of the principal statements in the article as follows. "Cases of progressive disease of the ears occurring in patients whose nervous organization is abnormal, and who usually complain of hissing, roaring, or ringing noises, whose ears upon examination with mirror and speculum present slight alterations, are found to have lost the power of hearing the lower tones of the musical scale. Among these cases a large percentage have a noticeable enlargement of the thyroid gland, and all have swelling or hypertrophy of the turbinate bones. The displacement of the malleus and locking of the malleo-incudal joint, brought about by the closure of the Eustachian tube in

consequence of the lack of inhibitory action upon the turbinate body by the thyroid gland, is, in the early stages of these affections, the cause of the impairment of hearing. In the later stages of the disease a fixation of the other ossicles takes place, until the stapes finally becomes firmly set in the niche of the foramen ovale, thus producing almost complete loss of sound conduction."

GORHAM BACON.

171. Two of three fatal cases of croup after measles, which showed Klebs-Loeffler's diphtheria bacilli in the croup-membrane of the throat, were complicated with purulent otitis media. The latter contained Loeffler's bacilli in the purulent aural discharge (as proven by culture and inoculation). One of them was a case of diphtheria of the middle ear, as confirmed by the fibrous pseudomembrane in the tympanic cavity, with diphtheria bacilli, which had spread from the pharynx to the mucous membrane of the tympanic cavity, predisposed by chronic inflammation. In the other case it was impossible to decide whether it was diphtheria of the middle ear or whether the diphtheria bacilli found in the purulent aural discharge had only a saprophytic character, since there was no fibrous exudation in the middle ear. Probably there existed at first an ordinary purulent otitis media (two weeks before the outbreak of measles), or a primary diphtheria of the middle ear. The diphtheria bacilli may cause infection from the middle ear long after subsidence of the affection of the pharynx. In that respect the middle ear is just as dangerous a hiding-place for bacilli as the nasal cavity. The author considers the croup in measles as well as the primary croup of the larynx as diphtheritic.

HAENEL.

172. MOURE observed a reddish tumor of the size of a grain at the entrance of the auditory canal of a woman, aged forty-seven. It was situated on top of another tumor, which seemed to spring from the posterior upper wall of the tympanum, and was surrounded by pus. Removal with snare produced a copious hemorrhage of dark blood. Tamponade with iodoform gauze for four days. The histological examination showed that it was an angiomatous polypus, some portions of which consisted of connective-tissue.

DUBAR.

173. George T., two years old, was admitted to the hospital, January 8, 1896. Two months previously he had suppuration of the right ear, which continued up to the present time. Five days ago the concha turned black and emitted a foul stench. The

necrotic process involved both the anterior and posterior surfaces of the concha. The sloughs were removed with scissors and a mastoid operation performed, as the bone was involved. The patient rallied well. Iodoform dressing was used. The progress toward recovery was excellent until the child had measles on January 25th, followed by pneumonia. It died January 31st. The post-mortem examination showed miliary tuberculosis of both lungs and pneumonia of the right lung, hyperæmia of the cerebral meninges, and hydrocephalus. GORHAM BACON.

174. At a meeting of the Midland Medical Society, held March 18, 1896, MARSH related the case of a man aged twenty, who had suffered with discharge from the right ear since measles in childhood, and occasional abscesses in the mastoid region; at the operation a cavity two inches in diameter was found in the mastoid filled with fœtid putty-like débris; the upper limit of the cavity was one inch above the superior meatal wall; bone surrounded the cavity except posteriorly where the cerebellum could be felt. CHEATLE.

175. FARACI discusses systematically and in detail the prognosis of surgical measures in regard to the hearing power, which it is impossible to enter upon here. He gives a great number of experimental facts, and his conclusions in regard to the mobilization of the stapes and its ectomy are very important.

GRADENIGO.

176. In the treatment of attic disease BRONNER advises enlargement of the perforation, removal of granulations and caseous matter by curette and syringe, the malleus and incus removed if loose. If these fail to produce a cure, and if the external meatus is too narrow to allow of treatment, he opens up and explores the attic, making a long incision behind and round the top of the ear down to the tragus, cutting through the meatus, pulling the whole ear downwards, and removing the outer attic and posterior meatal walls with the chisel. He relates the case of a man who had had middle-ear discharge for twenty years, during which time Wilde's incision had been necessary on three occasions. On operating, the mastoid was found healthy, but a large cholesteatoma occupied the attic. Of 42 cases of perforation in Shrapnell's membrane, 30 were cured by curetting and syringing; 2 required removal of ossicles under chloroform; and 10 had the radical operation performed. Bronner points out that some mastoid cells are found on a level with the attic, which require opening and scraping. CHEATLE.

177. In discussing this subject, JONES classifies cases of otorrhœa into five groups and appends the treatment he adopts for each group.

A. (i) Simple chronic purulent inflammation limited to the cavity of the tympanum, with perforation in the *membrana tensa*.

(ii) The disease limited as in (i) but accompanied by formation of polypi unconnected with bone disease.

(iii) In which removal polypi or granulations from easily accessible parts of the tympanum or meatus reveals small superficial patches of roughened bone.

Treatment : unless tubercular, this group amenable to simple methods, including curetting, if properly carried out.

B. (iv) Attic suppuration with or without caries of the ossicles.

(v) Cases originally belonging to one of the above four classes, in which adhesions between the ossicles, and ossicles and tympanic wall, interfere with drainage or cause extreme deafness, tinnitus, or giddiness.

Treatment : in the majority of cases in this group, remove ossicles.

C. (vi) Chronic suppuration in mastoid antrum.

(vii) Cholesteatoma.

(viii) Caries of antrum or some part of tympanic wall, which, though inaccessible per meatum, can be removed by operation without risk to important structures.

Treatment : Stacke-Schwartz operation.

D. (ix) Caries or necrosis of petrous bone which cannot be eradicated without destroying important structures or without risk of life.

Treatment : as exfoliation must take its own time it is best to establish a permanent opening in mastoid.

E. (x) Caries and hyperostosis or exostosis proceeding side by side.

Treatment : operation by means of a dental burr. Jones raises the question as to whether the whole tympanic mucosa should be removed, and thinks that, except in cases of tubercle, cholesteatoma, and extensive caries, it is better to preserve as much of the natural lining as possible, as perfect dryness is not a criterion of health in the middle ear any more than in the nose or mouth.

CHEATLE.

179. Nothing new, but a careful synopsis of the changes of otorrhœa. DU HAMON FOUGERAY recommends, after many trials, tamponade with gauze impregnated with naphthol-chinolin

(Haug), with some reservation, however. He observed a cure in 66 per cent. Finally he gives a model according to which he intends to record his statistics.

ZIMMERMANN.

180. A man, aged fifty-five, had purulent otitis of left ear for 4 weeks. Symptoms of mastoid disease set in; opening of mastoid; much pus was evacuated. Euphoria for 5 days was followed by severe meningitis. Death on the 17th day. The post-mortem examination revealed purulent meningitis at the base and convexity, thrombosis of sinus transversus, and longitudinalis; no abscess. Numerous abscesses in both kidneys. Advanced cirrhosis of the liver. Spleen enlarged and soft. Bacteriological examinations were made of pus, evacuated by trephining, pus from the dura taken at the post-mortem, blood of the longitudinal sinus, heart, liver, spleen, kidneys, and urine. In each case a bacillus was cultivated which was identical with the bacillus of Friedlaender morphologically and in cultures. BRUNNER surmises that this bacillus enters the middle ear from the naso-pharynx, where it is found even under normal conditions—rarely however,—and causes purulent otitis with general infection. The latter was favored by the cirrhosis of the liver, by which the “anti-bacterial coefficient” of the organism was weakened.

MUELLER.

181. MOURE does not acknowledge Zuckerkandl's statement in regard to the structure of the mastoid process—taken from abstracts—in cases of chronic suppuration. He found 4 pneumatic, 25 sclerosed and 4 unusually small mastoid processes out of 34 operative cases, of which 16 were chronic. Of the acute cases he found a normal antrum in 14, in 3 the antrum enlarged by fungoid masses, and one displaced forward. The antrum was reduced to a minimum in 10 chronic cases, in 5 considerably enlarged and without other pneumatic cells. These conditions were mostly owing to a destructive or sclerosing otitis. Moure relates two interesting cases. In the one the sinus was directly injured in opening a sclerosed mastoid process, so that the operation had to be interrupted. The patient died with a typical erysipelas, which had developed the next day. The post-mortem revealed that the antrum filled with cheesy matter corresponded to the centre of the osseous meatus, and the sinus, otherwise healthy, was situated immediately under the place of trephining. In the other case a cavity 5 mm deep was reached, which seemed to be filled with granulations. In scooping it with a sharp spoon it was

found to be the sinus. After removal of the posterior wall of the meatus the tympanic cavity and a very small antrum were reached. This was hidden by the projecting sinus and its tegmen was formed by the dura mater, where the bone showed dehiscence.

ZIMMERMANN.

182. TOTI's method differs from others in that he scrapes the walls of the opened middle-ear only in cases of cholesteatoma. Tamponade with iodoform-gauze. The lowest tampon remains until it loosens itself; boric acid is powdered between the old and new tampons.

GRADENIGO.

183. Cases of purulent mastoiditis without affection of the tympanic cavity are rare. LUBET-BARBON observed 6 in which the manner of development and localization were the common symptoms. They develop very slowly, sometimes 3 months from the original inflammation of the pharynx up to the acme. They cause intermittent ailments and the inflammation of the tympanic cavity, which has to be considered as medium, shows only slight symptoms. The course may be very treacherous by sudden general infection and cerebral complication, so that opening must not be delayed. The location is especially characteristic. Mostly the cells at the apex of the mastoid process have to be looked after in the operation, whereas ordinarily the antrum is first affected.

ZIMMERMANN.

184. None of the 3 cases was completely cured. The first case, of 1½ years' standing with still slight muco-purulent discharge from the tympanic "cavity," is mentioned as successful; also the other with suppuration scarcely noticeable. In the third acute case, tenderness of the mastoid process on pressure still existed when the patient left treatment, which had lasted a quarter of a year. The first and third cases were very serious, and the abstaining from an operation must appear rather dangerous to those who have seen a rupture of the abscess inwards under similar conditions. VEIHER had very favorable results with hydrogen chloride.

ZIMMERMANN.

185. SHEPPARD reports 2 cases of mastoid disease, 1 due to snuffing salt water up the nose, and the other due to influenza. Of 175 cases of affections of the mastoid, of which the writer has notes, only 2, to his knowledge, had diabetes. Sheppard believes that such cases should be operated on, and the earlier the better. In the 2 cases reported, both were operated on, with the

result that 1 recovered and 1 died. The cause of death was erysipelas and probably purulent meningitis. GORHAM BACON.

187. SZENES advocates the golden mean treatment.

POLLAK.

188. GRADENIGO operated on 48 acute and 88 chronic affections of the mastoid process, together 136, within 17 months. The male sex and the left ear were predominant. The acute affections are more frequent in the second, the chronic in the third decennium. Bezold's variety of mastoid suppuration in 30 %. A case of septic thrombosis of the sinus, and 4 cases of extradural perisinuous abscesses recovered, 1 died of meningitis. The mode of operating in the chronic cases was: complete suture of the wound at the mastoid and drainage of the meatus. Cholesteatoma existed in 30 cases. The necrotic cochlea was removed in 2 cases, sequestra of the mastoid process in 3, 2 cases of fatal meningitis, and 2 of cerebral abscess. One cerebral and 4 extradural abscesses recovered.

GRADENIGO.

189. A child aged four years was admitted, under Dr. Urban Pritchard, into King's College Hospital with a history of discharge from the right ear for six days, with shivering. On admission the boy was anxious-looking, complaining of pain in the ear, which was discharging a large amount of muco-purulent, non-offensive pus. A small pin's-head perforation in the membrane; tenderness behind the ear, but no redness or swelling; temperature 103° , under chloroform the membrane freely incised; no improvement on the following day; a soft spot found immediately behind the auricle; two days later fluctuation detected behind the ear; in Professor Urban Pritchard's absence A. CHEATLE cut down and found the mastoid process dry, discolored, and surrounded by pus; nothing definite in the antrum; an ulcer found on wall of lateral sinus opposite diseased mastoid; no thrombosis; death occurred suddenly some 33 hours after operation. Post-mortem examination showed site of operation healthy; on opening chest numerous small sub-pleural hemorrhages present, and a large recent hemorrhage in the posterior mediastinum; stripping of parietal pleura largely on the left side and slightly on the right; an irregular opening found in œsophagus opposite the tracheal bifurcation; the lower third of the tube soft and tearing easily; blood in stomach but not in small intestine; no foreign body. Cheatle thinks the case to have been one of acute infective œsophagitis secondary to the septic otitis. CHEATLE.

190. COZZOLINO reflects the soft parts to the root of the arcus zygomaticus in opening the mastoid, and uses the arcus as guide in entering the deeper parts.

GRADENIGO.

192. GRUNERT divides, from an anatomo-pathological standpoint, 209 observations from the ear clinic at Halle into those of caries and cholesteatoma, although they may occur simultaneously. In 113 cases of uncomplicated caries the tympanic cavity almost always was affected,—a reason why, in all cases, the operator must reach the tympanic cavity, as it is generally done. In 19 % of these cases only the ossicles were carious, in 13 % the tegmen tympani, the promontorium mostly superficially. In caries of the floor of the tympanic cavity sometimes the adjoining floor of the meatus was diseased. If the hammer is diseased, *the anvil also is always carious*. Only in 25 % the hammer was healthy. In 2 cases osseous ankylosis between them, and formation of osteophytes on each. The mastoid cavities, especially the lateral wall of the aditus, participated in about $\frac{9}{10}$ of all cases of caries. Even a large portion of the posterior wall of the meatus may also be affected. Tubercles, giant cells, and tubercle bacilli were rarely found.

Osteosclerosis occurred only in 10 % of this large number of cases of caries, in 5 % of which in the cortical substance of the mastoid process, and in 2 cases the antrum was entirely obliterated by this process. Grunert also opposes the theory of preventive reaction of osteosclerosis, since it occurs almost always at the surface, starting from the peritomeum, and does not encircle the focus of pus. In rare cases the lumen of the meatus grows smaller through sclerosis.

Out of 96 cases of cholesteatoma, thus far not published, the process was limited to the attic and tympanic cavity only in 5 ; in all others the mastoid cells were diseased. The cholesteatoma formed tumors in one third of the cases, and spread more in flat surfaces in two thirds, so that the cavities were lined with epidermis, but stratiform accumulations were wanting. Grunert thinks that this form may be the last stage of the disease. In some cases a cholesteatomatous cavity, communicating with the tympanic cavity at times, was situated under the floor of the meatus. A break of the masses into the maxillary joint has been observed.

The ossicles were generally also diseased, and thus the immigration of epidermis may occur through the perforation of Shrap-

nell's membrane—according to the well known supposition. Unlike caries, the most medial portion of the posterior wall of the meatus is not defective in cholesteatoma, but the lateral portion or the whole wall. In 6 cases the internal ear, the promontory, or the horizontal semicircular canal as perforated by the cholesteatoma. If this perforation is due to caries, the epithelium perhaps grows towards the antrum (from the semicircular canal), and thus produces cholesteatoma.

Osteosclerosis occurred more frequently than in caries, viz., in $13\frac{1}{2}\%$.

In either case, besides the atticus operation, the *antrum is typically opened* in Schwartze's clinic, and the posterior wall of the meatus, osseous portion, etc., removed. This is deviated from only in exceptional cases. The new-formed cavity must be laid open freely for inspection. In 9 out of 300 cases paralysis of the facial nerve occurred, which, as a rule, disappears within weeks or days. If granulations or sequestra have to be removed from the labyrinth, no special harm is done the ear, the hearing power of which is already destroyed. The same is the case in removal of the diseased stapes.

In large cholesteatomata always a persistent retroauricular opening is made.

The after treatment aims at epidermization and keeping open the whole bone cavity established by the operation. The best means to check the exuberant growth of granulations is careful tamponade. Later on the access of air acts beneficially on the definite formation of new skin. The obliteration of the tympanic orifice of the Eustachian tube must sometimes be artificially obtained by means of the galvano-cautery.

In concordance with Stacke, Schmiegelow, and others, 75 % recovered in Schwartze's clinic. But even in those cases in which recovery is not obtained, the patient gains through the free drainage and the possibility of a later secondary cure.

If the labyrinth has been intact, the hearing power may increase after removing the obstacles in the sound-conducting apparatus.

BLOCH.

193. In a man, aged twenty-five, with chronic purulent otitis of left ear, typical symptoms of cerebral abscess, viz., word blindness and right hemianopia (Wernicke's reflex symptom was preserved), developed with vertigo, right hemiparesis, vomiting, and headache. Operation: The severely diseased mastoid process

and tympanic cavity were scraped out, a portion of the squama and the tegmen removed. Then a small extradural abscess was detected. The dura mater was incised and a Potain's needle of largest size thrust into the temporal and occipital lobe and in the direction of the frontal lobe; no pus. Puncture repeated, but also unsuccessfully, after eleven days, since there was no improvement and fever had set in. A third puncture, after eight days, liberated pus from a focus in left occipital lobe. Death after eleven days. The post-mortem revealed an abscess of left occipital lobe of the size of an orange, which had opened into the lateral ventricle. The frontal convolutions were softened. The chief point of interest rests in the hemianopia, besides the word-blindness, in the opinion of the authors. They consider this as a much more frequent symptom, which, however, might easily be overlooked, because the patients do not mention it of their own accord. The needle may be supplanted by a trocar, since the former may easily become obstructed by brain matter, as happened in the two first punctures. Von Bergmann's method with the knife is not mentioned.

ZIMMERMANN.

194. In a portion of cases, sensory aphasia, or word-deafness, occurred, generally associated with paraphasia or amnesic aphasia, sometimes amnesic aphasia without word-deafness. The disturbance of speech is due to a lesion of the sensory centre of speech, or an interruption of the fibres connecting it with other cortical centres, or to both. In the rare cases in which the patient does not speak at all, making the impression of an aphasic, the inflammatory œdema and the softening extend perhaps as far as to the motor region of speech. If the fibres of association between the acoustic and the optic centres are severed, optic aphasia results, i.e., the incapability to name the objects seen; often, also, a certain difficulty in defining objects perceived by other senses, since the optic memory plays an important part in the formation of words. Optic aphasia is connected with partial word-deafness of all words and definitions, the understanding of which requires intact association of the centres of speech and vision, i.e., acoustic-optic aphasia.

HAENEL.

195. POULSEN collected the clinical histories and autopsies of all cases of cerebral affections after otitis media, treated in the Commune-Hospital of Copenhagen in the years 1870-1895; a case of cerebral abscess and one of thrombosis of the sinus, healed by operation in his private clinic. In connection with this material he

discusses in detail the symptomatology and therapeutics of such cerebral affections. Twelve of the cerebral abscesses were in the temporal lobe, 5 in the cerebellum; 4 of the latter were complicated with sinus thrombosis. In no case was the diagnosis of cerebellar abscess made. The 6 cases of cerebral abscess of the temporal lobe occurring *before* 1887 all died without operation, in 5 of the remaining 6 the cerebral abscess was opened by operation, 3 of which recovered. Poulsen often observed a relatively rapid development of cerebral abscess: 17 cases of thrombosis of the sinus, of which 10 were *before* 1891; 9 of these succumbed without the disease being recognized; 1 case with pretty certain diagnosis recovered through resection of the mastoid process without opening the sinus. The opening of the sinus after trephining was performed in 5 of the cases treated since 1891, each without tying the jugular vein, only *one* recovery. Poulsen is aware that the ligature of the jugular vein obstructs the chief passage for thrombotic particles, but gives no absolute guaranty and is not without danger. Therefore he does not recommend the ligature and advises to limit the emptying of the sinus and the removal of the purulent parts of the thrombus, since the hemorrhages of the sinus following its thorough cleansing often necessitate a long-lasting tight tamponade, which might lead to retention of pus. All 19 cases of meningitis died. If cerebral symptoms set in in the course of a chronic otitis media, which do not admit of an exact diagnosis of a certain cerebral affection, and persist even after a thorough scraping of the tympanic cavity and resection of the mastoid process, Poulsen advocates explorative trephining of the skull. If no extradural abscess is found nor thrombosis of the sinus, the puncture or incision of the brain is perfectly legitimate.

HAENEL.

196. In a case of cholesteatoma in a boy, aged thirteen, vomiting, occipital headache, stiffness of the neck, retardation of the pulse and bilateral papillitis occurred. At the operation, besides a large decaying cholesteatoma, a non-infectious thrombus, adhering to the wall of the sinus transversus, was met with, but neither a subdural nor a cerebellar abscess was found, nor one in the temporal lobe. Both were punctured. However, a large quantity of fluid gushed out after opening the dura mater, followed by a prolapse of cerebral substance. All symptoms disappeared after the operation. From this and the enormous secretion of cerebro-spinal fluid KRETSCHMANN inferred that it might be a case of serous

meningitis, as described by *Quinke*. The further course confirmed his assumption, since a relapse of cerebral symptoms disappeared by itself within three weeks, after the secretion of cerebro-spinal fluid increased, which had been diminished with the onset of the former. Therefore the symptoms must have been due to a retention of fluid. The author attributes the cause of the serous meningitis to the long-standing suppuration in the petrous bone, analogous to the appearance of serous pleurisy in curves of the ribs and similar processes. For the treatment of serous meningitis a wide opening of the cranial cavity may be indicated, the more so as an exact diagnosis generally cannot be made, especially since the formation of an abscess cannot safely be excluded.

MUELLER.

197. LICHTENBERG reports a case of otitic perisinuous and peridural abscess of the middle cranial fossa, operated on, but without anything specially remarkable.

POLLAK.

199. OLIVER reports a case of a man aged twenty-six, a printer, well nourished. The patient had had four months previously an intense acute otitis media with drumhead bulging. Paracentesis was performed and fluid evacuated. The drumhead was punctured a second time, and after that there was a profuse discharge and the man was able to attend to his duties. When next seen the patient was at his residence, comatose, with pulse 90, pupils contracted to size of a pin's head; Cheyne-Stokes respiration. He was removed to the hospital. He became restless, had a high temperature and was in a semi-comatose condition. An exploratory opening was made in the skull and the temporo-sphenoidal lobe examined, but no pus was found. A trephine opening was then made in the bone on a level slightly below the external occipital protuberance and slightly nearer the mastoid portion of the temporal bone than the protuberance. The cerebellar lobe was explored but nothing was found. The patient died 45 minutes after removal to the ward. At the autopsy there was found a diffuse purulent meningitis involving both the convexity and base. There was considerable caries of the temporal bone.

GORHAM BACON.

200. W. B., aged twenty, a waiter, entered the hospital July 22, 1895, with a history of headache, loss of appetite, and nausea. The left ear had discharged since he was six years of age. During the past three days he has had severe pain in the left ear and left side of the head. Examination showed the presence of a large

polypus with an offensive discharge. The polypus was partly removed and the ear syringed with antiseptic solutions. The auditory canal became more swollen and the head symptoms more pronounced; pulse, 60 and full; respirations, 10; temperature, 97° F.; pupils reacted slowly to light. He finally had delirium, chills, vomiting, dizziness, prostration, and convulsions. No operation was undertaken. At the autopsy there were found two or three distinct openings in the roof of the tympanum and leading to an abscess in the temporo-sphenoidal lobe, the size of a walnut.

GORHAM BACON.

201. After considering the importance and necessity of treating carefully all cases of suppurative disease of the ear, as well as the dangers of neglect of treatment, the writer reports the following case: A young man, aged twenty-two, a farmer, healthy in appearance and of good habits, had a discharge four months ago from his left ear, and this had continued ever since. When seen at this time he had considerable pain in the ear and head, which was worse at night. His appetite was poor, and he was feeling very badly. The discharge from the ear was most offensive; hearing markedly less than it had been. On examination there were symptoms of mastoid disease, with swelling of the external auditory canal. The drumhead was wanting, except for a small part superiorly. In the attic was bad-smelling pus. Watch not heard, and tuning-fork doubtful. Temperature, 99° F., and the pulse was not very strong. The canal was cleaned out and some scraping done in the attic. In two weeks' time the same condition of affairs had returned—*i. e.*, canal narrowed, granulations numerous, and discharge very offensive. He disappeared from observation for some little time, and when next seen he was admitted to the hospital in a critical condition; he had his eyes half closed, mouth open, and breathing stertorously. The ear was raised from the head, and the canal showed the same appearance as before. He complained of headache. The neck was stiff, and the respirations rapid, as frequent as 42, and the pulse weak, thready, and rapid. Temperature, 100.2° F. It was suspected to be a case of basilar meningitis. The ice-coil was applied to shaven vertex and left side of head, the ear was douched, and iodide of potash given in good-sized doses. At first there was a slight improvement, but later the patient became worse. The attic was again scraped, and later a button of bone removed from the skull, the centre of the opening being $1\frac{1}{4}$ inches behind and $1\frac{1}{4}$ inches

above the centre of the auditory meatus. A healthy dura protruded through the opening. A trocar was plunged into the brain substance in different directions, but no abscess was discovered. He died twelve hours later.

Autopsy.—Lungs showed many miliary tubercles. On removing brain, a typical basilar meningitis was found, extending down on the medulla. In examining the left temporal bone, the entire cochlea was found disorganized and filled, as were the semi-circular canals, with the same pultaceous mass as was the middle ear. Some tubercle bacilli were found in the contents removed from the middle ear.

GORHAM BACON.

202. Of the two cases reported, one was that of a woman, aged fifty-seven, who had suffered from diabetes for the past six or seven years. She had pain in the right ear, with some redness of the drumhead, and redness and swelling of the auditory canal. The symptoms increased in severity for a time, but subsided under hot-water applications and syringing of the ear.

The second case was that of a patient sixty-five years of age, in whom the mastoid region alone was involved, with only slight congestion of the drumhead. The pain, slight at first, became much more severe. The hearing was good at all times. A deep incision, made over the affected area, showed a diseased periosteum.

GORHAM BACON.

203. The cases had been operated upon in the surgical department of the Academic Hospital at Upsala, in the year 1894. Thrombosis of the sinus originated in acute otitis media in 2 cases, one of which was apparently very slight, without perforation; in a third case it was due to cholesteatoma of the middle ear. The double ligature and cutting of the jugular vein preceded in each case the incision or emptying of the sinus after opening the mastoid process. DAHLGREN advises this method in all cases. The operation was successful in all the three cases, also in regard to the ear affection.

HAENEL.

204. VENTRINI's paper is based on 3 cases from Gradenigo's clinic. The operation was successful in 2 cases, the third was fatal, because the operation came too late. The symptoms and treatment are set forth in detail.

GRADENIGO.

205. In 64 out of 214 cases of influenza-otitis, the epitympanic portion (attic) was diseased. Ten clinical histories and 2 post-mortem examinations are reported as typical forms. Influenza-bacilli were found in a few cases. HAUG mentions the

hemorrhagic nature of the inflammation as characteristic, in concordance with others. The exudation does not relapse after early paracentesis, for it is absorbed even without the latter. Conic bulging of the *Mt*, with perforation at the apex, required surgical treatment, as it did not disappear by itself. If the exudation was in front of the short process, vertigo and mastoid complications did not occur, as they usually did in affections of the posterior portion of the attic. In the latter the mastoid process may be primarily affected, and their course is the same as in other similar cases. Caries may be found after the third or fourth week, if not operated on before. The healing of the cases operated on may take from five to seventeen weeks, as in uncomplicated cases. In the case of thrombosis of the sinus, the decaying matter was removed. Recovery took place without ligating the jugular vein.

BLOCH.

NERVOUS APPARATUS.

206. BONNIER. The lesions of the labyrinth and the reflexes. *Communic. à la Société de Biologie*, Paris, 1896; *Médecine moderne*.

207. GELLÉ. Treatment of labyrinthine vertigo. *Ann. des mal. de l'or.*, etc., No. 6, 1896.

206. BONNIER attempted to investigate, whether affections of the labyrinth, with marked disturbances of equilibrium and visual and bulbar symptoms, influence the patellar reflex. He observed that the reflexes are little changed, if the labyrinthine symptoms develop slowly, and in acute diseases of the labyrinth through exudations in the labyrinth. The patellar reflexes are increased, however, in acute "insufficiency" of the labyrinth, diminished in labyrinthine irritation.

DUBAR.

207. GELLÉ's observations are based on the remarkable number of over 500 cases of aural vertigo. He discriminates 8 species of vertigo: (1) Dependent upon pressure from the middle ear; (2) due to hemorrhages; (3) to congestion; (4) anæmia; (5) hyperæsthesia; (6) inflammation in the labyrinth; (7) toxæmia; and (8) reflexes. These different forms may be combined. Sulphate of quinine is the chief remedy.

ZIMMERMANN.

NOSE AND NASO-PHARYNX.

208. FERMI E BRETSCHNEIDER. Studies on the nature and etiology of catarrhal rhinitis simplex. *Arch. ital. di Otol.*, anno iii., p. 438; anno iv., p. 23.

209. WOODRUFF, E. G., Auburn, N. Y. Acute and chronic rhinitis in childhood, and its importance. *Wien. med. Blätter*, No. 27, 1896.
210. GERBER and PODACK, Koenigsberg. On the relations of the so-called primary fibrinous rhinitis and the so-called pseudo-diphtheria bacillus to the diphtheria bacillus of Klebs-Loeffler. *Deutsches Arch. f. klin. Med.*, vol. liv., 14.
211. FORTUNATI. On a rare form of neuro-paralytic keratitis of nasal origin. *Arch. ital. di Otol.*, etc., anno iv., p. 169.
212. BOULAY, M. Epileptiform attacks and hypertrophy of the tonsils. *Arch. intern. de laryng.*, etc., No. 3, 1896.
213. ABERCROMBIE, P. H. Valerianate of zinc in hay-fever. *Brit. Med. Fourn.*, April 19, 1896.
214. BULETTE, WILBUR W. A case of asthma due to nasal obstruction and adenoids of the pharyngeal vault. *New England Med. Monthly*, June, 1896.
215. SCHEPPEGRELL, W. The treatment of hypertrophic rhinitis by the bipolar method of electrolysis. *Ann. Ophth. and Otol.*, April, 1896.
216. MAYER, EMIL. The nasal mucous membrane. A plea for greater care of it in intranasal operations. *N. Y. Med. Fourn.*, June 15, 1896.
217. BELFANTI e DELLA VEDOVA. On the etiology of ozæna and its curability by serum-therapy. *Arch. ital. di Otol.*, 1896, p. 189.
218. GRADENIGO. On serum-therapy in ozæna. *Ibid.*, p. 195.
219. GRADENIGO. On treatment of a form of otitis and ozæna with antidiphtheritic serum. *Ibid.*, p. 336.
220. ARSLAN e CATTERINA. On treatment of ozæna with serum. *Ibid.*, p. 331.
221. DELLA VEDOVA. On the treatment of ozæna with serum. *Ibid.*, p. 334.
222. CHIACONI. Supernumerary dentition in the nose. *Ibid.*, p. 289.
223. FRAENKEL, EUGEN, Hamburg. Contributions to the pathology and etiology of affections of the accessory cavities of the nose (from the new general hospital of Hamburg). *Virchow's Arch.*, vol. cxliii.

224. RÉTHI, L., Vienna. Treatment of suppuration of the nasal accessory cavities. *Wien. med. Presse*, No. 16, 317, 1896.

225. DUNAGIER. On prothesis in the treatment of empyema of the antrum of Highmore. Bordeaux, 1896.

226. LUC. Treatment of chronic empyema of the frontal sinus by a large opening of the anterior wall of the sinus and by drainage into the nose. Method of Ogston and Luc. *Arch. intern. de laryng.*, etc., No. 3, 1896.

227. MERMOD. Meningo-encephalitis following the exploration of a so-called frontal sinus. *Ann. des mal. de l'or.*, No. 4, 1896.

228. GLEITSMANN. Diseases of the accessory sinuses of the nose, with demonstration of specimens, drawings, and instruments. *Annals of Ophth. and Otol.*, April, 1896, and *N. Y. mediz. Monatsschr.*, April, 1896.

229. LACK, LAMBERT. Case of healed antrum and frontal sinus suppuration. *Proceedings of the Laryngological Society of London*, May 13, 1896.

230. BABER, CRESSWELL. Note on the diagnosis of latent abscess of the maxillary antrum. *Brit. Med. Fourn.*, June 27, 1896.

231. COBB, FRED. E. Empyema of the antrum of Highmore. *Bost. Med. and Surg. Fourn.*, May 7, 1896.

232. TILLEY, H. Case and specimen of cured polypi of frontal sinus. *Proceedings of the Laryngological Society of London*, May 13, 1896.

233. SOMERS, LEWIS S. Nasal syphilis with extensive lesions. *Med. and Surg. Reporter*, April 25, 1896.

234. SYMONDS, C. J. Foreign bodies in the upper air and food passages. *Proceedings of the Laryngological Society of London*, 1896.

235. SCHEPPEGRELL, W. The etiology, symptoms, and treatment of rhinoliths, with the report of a case. *Fourn. Am. Med. Assoc.*, May 2, 1896.

236. KNIGHT, CHAS. H. A case of fibroma of the nasal fossa. *New Eng. Med. Monthly*, May, 1896.

237. BOND, J. W. Case of sarcoma recurring in nose. *Proceedings of the Laryngological Society of London*, May 13, 1896.

238. FREYTAG, B., Magdeburg. On fractures of the nose. *Monatsschr. f. Ohrenheilk.*, No. 5, 1896.

239. LERMOYEZ. Two cases of insufficiency of the palatal velum. *Ann. des mal. de l'or.*, etc., No. 4, 1896.
240. COLLIER, MAYO. Some effects of chronic nasal obstruction on the growing skull and upper jaw. *Brit. Med. Journ.*, May 11, 1896.
241. SCHEPPEGRELL, W. Papillomata of the soft palate. *N. Y. Med. Journ.*, April 11, 1896.
242. CAMPBELL, JAMES T. Pharyngomycosis leptothricia. *Med. News*, April 4, 1896.
243. KOPLIK, HENRY. The acute retropharyngeal abscess of infancy and childhood. *N. Y. Med. Journ.*, April 4, 1896.
244. MEYER, WILLY. Incisions of retropharyngeal abscess according to antiseptic principles—from the neck. *Amer. Med. and Surg. Bulletin*, April 4, 1896.
245. MAYER, EMIL. Idiopathic retropharyngeal abscess, with a report of three cases. *N. Y. Eye and Ear Infirmary Reports*, 1896.
246. SEMON, FELIX. Chronic retropharyngeal abscess in an adult. *Proceedings of Laryngological Society of London*, May 13, 1896.
247. EVANS, T. C. Chancre of the tonsil and tongue, with report of four cases. *Med. News*, May 9, 1896.
248. GRIFFIN, E. HARRISON. Chancre found in unusual localities. *N. Y. Med. Journ.*, May 23, 1896.
249. WRIGHT, G. A. Note on certain "dermoid" cysts. *Brit. Med. Journ.*, April 18, 1896.
250. WOODS, R. H. Modification of the Indian rhinoplastic operation. *Brit. Med. Journ.*, April 18, 1896.
251. SCHEPPEGRELL, W. Vertigo of naso-pharyngeal origin. *Med. News*, May 23, 1896.
252. MAKUEN, G. HUDSON. A case of stammering; cure by an operation. *Med. and Surg. Reporter*, May 23, 1896.
253. KOLLBRUNNER, EMIL. On total synechiæ between the soft palate and the posterior wall of pharynx. *Dissert.*, Strassburg, 1896.
254. HELLER, ADOLF, Nuernberg. The naso-pharynx in pathology. *Deutsch. Arch. f. klin. Med.*, vol. lv., p. 25.
253. STICKER, GEO. Atrophy and dry catarrh of the respiratory membrane; its relation to syphilis. (Metasyphilitic xerosis

of the respiratory tract.) From the medical clinic of Professor Riegel at Giessen. *Deutsch. Arch. f. klin. Med.*, vol. lvii., p. 118.

256. RUGE, HANS, Berlin. Tuberculosis of the tonsil from a clinical aspect. *Virchow's Arch.*, vol. cxliv., p. 431.

257. DEICHERT, H., Goettingen. Formation of cartilage and bone in the tonsils. *Virchow's Arch.*, vol. cxli., p. 435.

258. LACOARRET. Post-diphtheritic pseudo-hypertrophy of the tonsils. *Rev. hebdom. de laryng.*, No. 21, 1896.

259. PIERGILI. A case of severe hemorrhage following tonsillectomy. *Arch. ital. di Otol.*, etc., 1896, p. 283.

260. ARSLAN. Contribution to the study of tumors of the tonsils. *Bollettino delle malattie dell' orecchio*, etc., April, 1896.

208. FERMI and BRETSCHNEIDER made numerous bacteriological investigations and experiments on animals and healthy persons to elucidate the pathogenesis of acute coryza. After a short introduction they discuss the symptoms, the origin, the general causes of coryza, and the various hypotheses, then they report their very elaborate researches as to the occurrence of micro-organisms in the healthy mucous membrane and in catarrhal rhinitis, and as to the communication of coryza to persons and animals. The details have to be read in the original. The authors reach the conclusion, that the acute coryza is no specific infectious disease; other causes, direct influences, external agents in connection with infectious diseases and under concurrence of the nervous system, account for its origin. GRADENIGO.

209. WOODRUFF mentions as concomitant and subsequent symptoms of chronic rhinitis: bronchitis, pavor nocturnus, enuresis nocturna, defective development of the thorax, scoliosis of the spine (!), impairment of hearing, blennorrhœa of the lachrymal sac, disturbed function of the brain, retro-pharyngeal abscesses, cerebro-spinal meningitis. POLLAK.

210. GERBER and PODACK proved the diphtheritic nature of primary fibrinous rhinitis in five cases by the presence of virulent bacilli of Klebs-Loeffler in the fibrinous secretions of the nose. They emphasize the great danger of infection in these cases on account of the relatively slight symptoms and the chronic course, and insist on strict isolation. Because of the scarcity of diphtheria bacilli in the direct dry preparation the diagnosis absolutely requires cultures and inoculations of animals. The authors

found the pseudo-diphtheria bacillus in three of the cases mentioned long after the subsidence of the fibrinous exudations, in two in the purulent nasal secretion, and in one in the discharge of a purulent otitis media which commenced two months after the disappearance of the membranes from the nose. In a case of rhinitis atrophicans they found the pseudo-diphtheria bacillus in the crusts twelve years after diphtheria which had extended into the nose. They doubt a connection between the pseudo-diphtheria bacillus and simultaneous anatomo-pathological changes, but think that a direct relation exists between diphtheria and the later occurrence of pseudo-diphtheria bacilli, surmising that the latter are genuine diphtheria bacilli which have grown avirulent, but may regain their virulence by symbiosis with streptococci or by any other circumstances (*cf.* Yersin, Roux, C. Fraenkel). HAENEL.

211. FORTUNATI describes two cases of severe ulcerous keratitis presenting a certain relation to hypertrophic changes in the nose. GRADENIGO.

212. A boy, aged twelve and a half, constantly suffered every morning for two years from convulsions which were preceded by an aura of formication, fright, and sensation of stiffness in the tongue. The convulsions were combined with loss of consciousness, stiffness of the limbs, and asphyxia. Incontinence of urine; no mark of bites on the tongue. Prompt disappearance after tonsillotomy. ZIMMERMANN.

213. ABERCROMBIE obtained a cure in a patient who suffered from hay-fever by the exhibition of valerianate of zinc, 3 iii in pill, three times a day.

214. BULETTE reports the case of a girl, aged eleven, who had been suffering for two years from difficulty of breathing and attacks of asthma, particularly during the night, together with tinnitus aurium and headache. Anterior and posterior nasal hypertrophies, a large septal ridge on the left side, and enormous masses of adenoid tissue in the naso-pharynx had caused the attacks, which were promptly relieved by operation.

M. TOEPLITZ.

215. SCHEPPEGRELL militates against the use of cocain, the electro-cautery, chromic acid, and trichloracetic acid for the treatment of hypertrophic rhinitis, and advocates electrolysis, which, applied submucously, avoids the formation of cicatrices. He employs the galvanic current with the selector or the Edison current with a rheostat, and for either a milliampèremeter. The

bipolar method, by means of the introduction of two platinum needles soldered to copper, is now exclusively used.

M. TOEPLITZ.

216. After an extensive description of the anatomy of the nasal mucous membrane, MAYER militates against the use of the saw, electric burr or plane, and the galvano-cautery, which destroy too much of the mucous membrane. He removes ecchondroses of the septum by dissecting an L-shaped flap of mucous membrane and stitching it back later on, or he uses the electric trephine through the cartilage below the mucous membrane, and removes soft hypertrophies with the cold snare. M. TOEPLITZ.

217. BELFANTI and DELLA VEDOVA examined sixty-three cases of ozæna in regard to the bacillus mucosus of Lœwenberg and Abel, and found a bacillus, to which they attribute some importance in the etiology of ozæna on account of its constant occurrence. It has the properties of the diphtheria bacillus, but differs from it by its absolute inactivity on animals. Mice are immune. In guinea-pigs œdemata and abscesses occur at the place of injection. The ozæna bacillus is mostly analogous to the bacillus of xerosis; it grows well on coagulated serum but not on gelatine. Both authors found that diphtheria antitoxine was antagonistic to the ozæna bacillus in animals, and treated thirty-two patients accordingly with antitoxine. In almost all cases an improvement was attained, in many a condition equivalent to a cure; 5,200 to 27,200 immunizing units were injected.

GRADENIGO.

218. GRADENIGO reports his first investigations which he undertook to verify the results of Belfanti. Fourteen cases were cured, of which 9 were of sufficient duration to count them as results. The maximal doses of immunizing units injected in a patient was 17,450; the minimal, 6000. Gradenigo could not obtain a cure in any case. In 5 cases remarkable improvement immediately after the first injection, but without any progress by continued treatment. In 1 case transient improvement, in 3 cases no alteration at all. Gradenigo believes that a certain amount of cases of ozæna is due to syphilis, others to tuberculosis, and that in others a diathesis cannot be made out. According to this also a bacteriological variety of ozæna may occur.

GRADENIGO.

219. In a later communication GRADENIGO reports that he could prove the constant occurrence of the bacillus of Belfanti,

in 50 cases, 24 were treated; 2 are in such a condition that they may be considered as cured, 9 very much improved, 5 slightly or not improved, 7 uncertain. In one case of the almost cured, the improvement commenced not before a few days after the treatment ceased, which had lasted 41 days with 28,500 immunizing units. The improvement obtained was not in proportion to the number of immunizing units injected and to the time of treatment. Definite amelioration sets in not before about 15 injections with 1000 units. In chronic purulent otitis and in dry aural catarrh with ozæna, antitoxine brought about considerable improvement. The serum therapy may be indicated also in other forms of purulent otitis, if the bacillus of Belfanti is found.

GRADENIGO.

220. ARSLAN and CATTERINA confirm the constant occurrence of Loewenberg's and Belfanti's bacillus. Four cases of ozæna improved by serum therapy.

GRADENIGO.

221. DELLA VEDOVA obtained a cure in 2 out of 7 cases, and in 2 slight improvement.

GRADENIGO.

222. In a girl with severe ozæna and changes of the alveolar process, a molar tooth and two exostoses, with impressions by other teeth, were extracted. An example of formation of supernumerary teeth.

GRADENIGO.

223. FRAENKEL studied the affections of the accessory nasal cavities in 146 post-mortem examinations, bacteriologically and histologically. He expresses his results in the following words: In a large number of persons with normal accessory nasal sinuses, the latter contain micro-organisms, which play a prominent part in many inflammatory processes of the respiratory tract (*diplococcus lanceolatus* Fraenkel, *staphylococcus pyogenes flavus* and *albus*, etc.). Diseases of the nasal sinuses are surprisingly frequent. In 43 per cent. of his cases, one or several sinuses were diseased; the antrum of Highmore most frequently (53 times), then the sphenoidal sinuses (25 times), disproportionately rare the frontal sinuses (only 5 times). Inflammation of the sinuses, in most cases, is independent of diseases of the nasal passages. The dental origin of inflammation of the maxillary sinuses is generally overestimated. Probably they are due to general diseases more frequently than heretofore supposed, as acute fibrinous pneumonia, measles, scarlet fever, diphtheria of pharynx, cerebro-spinal meningitis, acute peritonitis, and other diseases.

This view of the author is in opposition to that of Zuckerkandl,

who thinks that the inflammations of the sinuses are affections propagated from the nasal passages.

The action of bacteria on the sinuses is not constant, and the presence of a certain micro-organism cannot be inferred from the character of the disease. The occurrence of different micro-organisms may perhaps modify the prognosis of the affections. Diseases of the sinuses would probably be more frequently diagnosed, if systematic rhinoscopy would be practised in all affections of the respiratory tract, and not only if subjective symptoms indicate a nasal trouble. The thickening of the infundibular region is due to irritation from the discharge of the sinuses. Nasal polypi are no evidence of a preceding affection of the sinuses. F. found caries and necrosis of the nasal walls only in tuberculosis and syphilis.

HAENEL.

224. RÉTHI gives a clear synopsis of the empyemata of the sinuses, treated by him, especially in regard to therapeutic results. To that purpose Réthi divides his 78 cases of *empyema of the antrum of Highmore* into two groups: those which he treated from the middle nasal meatus (the hiatus, or an accessory ostium, or an artificial perforation in the lateral wall), and those treated from the lower meatus, or the alveolar process, or the fossa canina. Either treatment yielded about the same results, *i. e.*, 43 per cent. recoveries. Therefore Réthi recommends treatment of the antrum through the hiatus if possible, and if neither caries nor considerable hypertrophy of the mucous membrane exists. The hiatus is permeable for a probe in about 50 per cent. If it is, however, hardly or not at all accessible, or closed, the lateral wall of the middle meatus has to be opened. If empyema is caused by carious teeth, it has to be approached through an alveolus. Although the latter operation gives the patients the advantage to irrigate the antrum themselves, they rather dispense with it, if they know the uncertain chances of this operation, and they would not likely sacrifice a healthy tooth, if a certain cure cannot be promised.

Réthi treated 19 cases of *empyema of the frontal sinus*. After the removal of polypoid growths and of the anterior extremity of the middle turbinated body, the sinus could be probed in 25 per cent. of the cases. Fifty-eight per cent. were cured by irrigations through the natural canal, *i. e.*, in a larger percentage than in empyema of the antrum.

Forty-six per cent. of 35 cases of *empyema of the ethmoidal cells* were cured by removal of polypi, hypertrophies, and portions of the middle turbinated body, or by scraping.

Out of 16 cases of *empyema of the sphenoidal sinuses* Réthi treated 2 through the natural, very wide opening, and 14 after opening very freely the anterior wall, with a cure in 70 per cent. Réthi states that, on the whole, his experience of several years taught him to be more conservative in the treatment of empyema of the nasal sinuses.

POLLAK.

225. DUNAGIER recommends a dental plate of hard rubber, with a pin to be introduced into the canal formed by the drill. After the empyema is healed the pin can simply be cut off.

ZIMMERMANN.

226. LUC observed, that creamy pus is characteristic of empyema of the frontal sinus; pus containing granules, of empyema of the antrum of Highmore.

ZIMMERMANN.

227. MERMOD probed the frontal sinus of a laborer, aged thirty-six, who had suffered for a long time from affections of almost all accessory nasal cavities which had been operated on. In the ensuing operation Mermod found that the frontal sinus was wanting, and that a meningo-encephalitis had set in, as proven by the post-mortem examination. Mermod condemns emphatically the method of Schaefer, and advocates a large opening of the diseased sinus.

ZIMMERMANN.

228. GLEITSMANN demonstrates the anatomy of the accessory sinuses by specimens and drawings, and briefly touches upon their pathology. The symptomatology and diagnosis are fully dwelt upon. He thinks transillumination to be overrated, although of value, and it ought, therefore, never to be omitted. The location of pus is pathognomonic, with a few exceptions, which are enumerated. Probing the orifices is important. The distance of the sphenoid is given as no less than 8 *cm* in males, and 7 *cm* in females. For treatment he follows Moritz-Schmidt's plan, first washing the maxillary sinus through the natural opening, then using the trocar through the lower nasal meatus and finally opening through the alveolus of the second molar or through the fossa canina. The ethmoidal cells are treated in this country by ablation of the anterior portions and hypertrophies of the middle turbinal bodies, and by curetting. For treatment of the frontal sinus the external opening is preferable. The sphenoidal sinus is intranasally perforated without much difficulty.

M. TOEPLITZ.

229. In LACK's patient the malar sinus suppuration was cured by a few weeks' syringing. The frontal sinus was opened through

an incision in the line of eyebrow, the field of operation bounded by the supraorbital notch and the pulley of superior oblique ; a large piece of bone removed by the chisel and much pus evacuated. A tube passed through infundibulum into the nose and worn for six weeks when the symptoms disappeared. An inconspicuous scar left in eyebrow. Patient well in two years. CHEATLE.

230. BABER considers that the only certain or pathognomonic sign is the demonstration of pus in the cavity by : (1) probing the natural orifice ; (2) puncture through the alveolus ; (3) puncture through the inferior meatus. He himself advocates the last, using a straight trocar and canula, as recommended by Grünwald ; the point of puncture being at about the junction of the anterior with the middle third and high up, a small aspirating syringe being fitted to the trocar, the point of which is tilted downwards ; if aspiration fails to withdraw pus, he employs Grünwald's plan of attaching a rubber bag to the canula and blowing air through ; the region of the middle turbinal being watched for pus. Baber suggests that aspiration should be effected after some air has been blown into the cavity, the air making an emulsion with the pus and so facilitating aspiration. He has used Grünwald's method in twenty-six cases, and has not failed to enter the antrum in any.

CHEATLE.

231. In the records of the Massachusetts General Hospital of the last 20 years, only about a dozen cases of empyema of the antrum were found, all of a grave type, which were easily diagnosed and operated from without by incision of fluctuating parts. Milder cases had been overlooked. COBB then discussed the diagnosis, which is not always established by transillumination, but positively by exploratory puncture from the lower nasal meatus by means of the electric drill with subsequent washing of the cavity. He does not like to perforate from the fossa canina on account of the reactionary swelling. A valuable guide to diagnosis is a peculiar thin brown mark on the handkerchief. In severe cases, wide opening and drainage are imperative. Latent cases are commonly obstinate. Cobb is in favor of a large alveolar opening. His best results were obtained in acute cases. He concludes with a full report of nine cases.

M. TOEPLITZ.

232. After removing polypi from under the middle turbinal on the left side of the nose, TILLEY found that a probe could be easily passed into the frontal sinus. Both sinuses opened by a median vertical incision, and found to contain granulations ; both

curetted and swabbed out with zinc chloride solution, gr. xl. to $\frac{3}{4}$ i, and drainage tubes inserted and retained for one week, daily irrigation with boracic lotion being practised; opening then allowed to heal, a cure of all trouble resulting. The antrum was explored but found to be healthy.

CHEATLE.

233. A man, aged thirty-two, was suffering, nine years after the contraction of syphilis, from an empyema of the right antrum Highmore, which was opened through the lower lid, right cheek, and right canine tooth, and from which two large sequestra were subsequently removed. Six months after the operation, SOMERS removed from the nasal cavity within two months: the entire right palate bone, the vomer, all the turbinals, various parts of the vertical plate of the ethmoid, and the cartilaginous septum. The tonsils, uvula, and right side of fauces had disappeared, and adhesion of the palatine arch to the posterior wall of pharynx had taken place. Ozæna and suppuration were greatly relieved by large doses of iodide of potassium and mercury.

M. TOEPLITZ.

234. In discussing the subject of foreign bodies in the nose, in young children, SYMONDS describes the symptoms in cases in which the foreign body has been some time resident, as being unilateral, purulent discharge often blood-stained or brown, and with no particularly unpleasant odor, with obstruction, examination revealing swollen mucous membrane and granulations, the foreign body being entirely hidden or appearing black either from its own color or from blood which has dried upon it. He advises examination under an anæsthetic unless the child is particularly good. The diagnosis must be made from unilateral ozæna, tubercular or syphilitic ulceration, and lupus. He relates case of a child, aged eleven, from whose nose he removed a true rhinolith, discharge having been present since the introduction of some rose leaves at the age of three. In discussing treatment he advocates more frequent trial of forcing a stream of water into the healthy side by means of Higginson's syringe. He has only once seen a foreign body in the post-nasal space, a head of a coarse grass, which had been coughed up behind the soft palate. Foreign bodies in the pharynx he divides into two classes: (1) small and penetrating, which usually become embedded in the root of the tongue, tonsil, or pharyngeal wall, or in the fold between the pharynx and tongue; (2) large bodies such as masses of food and tooth-plates. In searching for foreign bodies of the first class

he advises careful examination with a good light before employing digital examination, as a penetrating body may thereby be driven in, dislodged, or pushed farther down. In dislodging a large and impacted body, like a pipe stem, from the neighborhood of the tonsil, the possibility of hemorrhage must be remembered.

CHEATLE.

235. The rhinolith was observed in the right nostril of a girl, aged thirteen, who had suffered for three years from a unilateral discharge, headaches, and mouth-breathing. The left nostril was stenosed by the deflected septum; the right appeared atrophic with a black mass on the floor, which was partly broken by strong forceps, and the remaining portion then easily extracted. The stone weighed $24\frac{1}{2}$ grammes. The nucleus was formed by a blood clot. The paper concludes with a bibliography, a review of the theories of the etiology, the symptomatology, and removal by operation or hydrochloric acid.

M. TOEPLITZ.

236. KNIGHT's case of a pure fibroma occurred in a man, aged twenty-one. It was attached to the posterior end of the left middle turbinated body. The microscopical examination made by Dr. Jonathan Wright revealed a purely fibrous structure, without myxomatous tissue or vessels, and with collection of small round cells, at places near the surface, probably due to inflammation.

M. TOEPLITZ.

237. In October, 1893, a man aged sixty-two years came to BOND with the history of having had severe attacks of epistaxis since November, 1892. Examination revealed the left side of nose congested, greatly swollen, and plugged in front by a fluctating, slightly movable mass which bled freely on examination with a probe; enlarged glands felt below the left angle of the jaw. Mass snared and curetted and nose plugged. The site of growth (lower part of septum, floor and front of inferior turbinal) afterwards cauterized with the galvano-cautery; glands also removed. Recurrence in March, 1896, mass again removed, but at the time of report again recurred and a gland enlarged in neck.

CHEATLE.

238. FREYTAG reports a case of fracture of the nasal process of the supramaxillary bone and the lower turbinated body with expulsion of the latter. The septum was dislocated and probably the anterior ethmoidal region was also injured. The patient, a boy, aged ten years, had received a blow on the nose from the right by the fist.

KILLIAN.

239. LERMOYEZ published two cases of arrest of development of the osseous palate in addition to his 11 cases described before. Both cases showed disturbances which were due to the defective closure of the nasal cavity and pharynx. The velum palati was of normal dimensions, but was insufficient on account of its more anterior than normal insertion. ZIMMERMANN.

240. COLLIER thinks that the immediate result of nasal obstruction is a partial vacuum in the nasal chambers, causing, if the obstruction is chronic, collapse of the nasal wall; he attributes high palates and irregular teeth to this condition. CHEATLE.

241. SCHEPPEGRELL's first case accidentally discovered in a young woman, aged twenty-one, presented a tumor, with a pedicle, 15 mm long, attached to the soft palate near the uvula. It was spheroid, 9 mm in diameter, and caused no annoyance.

The second case occurred in a young man, aged eighteen, and was a pedunculated tumor, also attached to the soft palate, hanging down the uvula, although but 3 mm in diameter, caused an irritable cough, which began immediately after going to bed; it was cured by removal of the growth. M. TOEPLITZ.

242. CAMPBELL describes a case of pharyngomycosis lepto-thricia, in a girl aged eighteen, after diphtheria, which disappeared in three or four days, but reappeared at all seasons of the year, particularly during the colder months. Three years later the attacks reappeared after scarlet fever, at intervals of two months until nine months later, when the white spots remained permanent. They extended over both tonsils and a small portion of the posterior pharyngeal wall, and projected from the lacunæ. A month later they were also observed upon the base of the tongue. They were excised for microscopical examination, of which an excellent description is given by Dr. Lewellyn F. Barker of the Johns Hopkins Hospital. Treatment with chromic acid.

M. TOEPLITZ.

243. KOPLIK bases his experience upon 77 cases, which he divides into sets as follows: 1. Acute, pointing, (a) wholly internally, (b) internally and externally, (c) chiefly externally. 2. Chronic tuberculous. 3. Septic retropharyngeal abscess; the latter are burrowing abscesses due to infection after or with the exanthemata. An idiopathic abscess is an impossibility, since there is an intimate relation between the tonsils, gums, and soft palate and the lymphatic system behind the pharynx. Streptococci are always present in the depths of tonsillar lacunæ.

Stomatitides, angina, and influenza are the causative factors of retropharyngeal abscess, the pus of which contains four non-virulent species of streptococci. The acute abscess is pre-eminently a disease of infancy and most frequently between the sixth and twelfth months during the period of suckling. The abscess may open spontaneously, leading to recovery; complications, such as asphyxia, pneumonia, reflex syncope, hemorrhage from large blood-vessels, connection with inner ear, have been observed. Koplik holds the prognosis of uncomplicated cases to be good when treated by timely operation. In most cases internal incisions are sufficient, particularly in set 1. In the second set, in which deep cervical glands at the side of the neck are involved with the primary abscess behind the pharynx, and in tuberculous abscesses, Koplik advocates the operation from without.

M. TOEPLITZ.

244. MEYER reports the results attained in four cases of retropharyngeal abscess by the opening from without. He prefers Burkhardt's method, which consists in cutting at a level with the larynx on the inner side of the sterno-cleido-mastoid muscle and ligating the encountered subcutaneous veins. The exposed carotid is held aside and the incision made in the depth, just at the side of the larynx. The operation is to be performed in Rose's posture (the head hanging down), in septic and tuberculous cases of adults as well as in infants.

M. TOEPLITZ.

245. MAYER discusses the rarity of retropharyngeal abscess, its prevalent occurrence in early childhood, its occasional appearance also in adult life even in the acute form, its symptomatology and treatment. He prefers the internal incision on account of saving of time, the danger of chloroform, the absence of aseptic conditions in the surroundings of the patient, the immediate success, the long delay of ultimate recovery after external operation, which leaves a permanent external scar.

He reports three cases, which he had observed in children, aged one year, six months, and six weeks respectively, the first of which had been incised and recovered, the second had died of exhaustion before an attempt at operation was made, and in the third absorption had taken place without operation. An extensive bibliography is appended.

M. TOEPLITZ.

246. In SEMON's case an abscess formed in the posterior pharyngeal wall without any definite cause. The patient aged thirty-seven had an indistinct history of syphilis. Although the

pus had been evacuated no improvement had taken place. Iodide of potassium was being exhibited ; if a cure did not result Semon proposed to thoroughly open and scrape. The case was shown, because such a condition without any known traumatic or diathetic cause is rare. CHEATLE.

247. The diagnosis of primary syphilis of the mouth and tonsils can be arrived at by exclusion, since all ulcerative lesions of these parts are either malignant, tubercular, or syphilitic. In carcinoma of the tonsil, the pain and enlargement of the tonsil precede the ulceration for several months. Primary ulcerations are best distinguished from those of secondary and tertiary stages of syphilis by the unilateral involvement of the cervical and sub-maxillary glands. These facts are illustrated by four cases. The tonsil is next to the lips the most frequent seat of extra-genital chancre. Secondary eruptions, mostly papular, appear rather early after tonsillar chancre, which is often innocently acquired.

M. TOEPLITZ.

248. GRIFFIN reports twenty additional cases of extragenital chancre, which generally originates in a mucous patch, but is often directly inoculated from a primary sore. The bubo on the corresponding side of the neck was present in all cases but one. The chancre gives little pain. Chancre of the mouth occurs earlier than others, often even during the first and second weeks. In strumous persons the glands are larger than in infected healthy ones. The eruption develops early, even as early as six days after primary chancre, the severity being the same according to the constitution. Many cases come from kissing. There were eight chancres of the lip, four of the tongue (among which was one of the base of the tongue without bubo), two of the tonsil due to sexual perversion, one ulcer of the nose, one of the gum inoculated by a tooth-brush, one of the nipple from nursing, one of the anus of a child, twenty-six months old produced by wiping with a cloth used by his syphilitic grandfather, one of the lower portion of the hand from a bite, and one of the anus of a boy, aged ten, from pæderasty. Griffin militates against the practice of kissing. Syphilis is not always a venereal disease and should be reported. Prostitution should be governed by law.

M. TOEPLITZ.

249. WRIGHT draws attention to dermoid cysts of the tip of the nose. He also relates two cases in which ulceration was present in front of the pinna in connection with a so-called

auricular fistula ; he thought the ulceration was tuberculous but no bacilli could be found.

M. TOEPLITZ.

250. A patient of Woods's had had the cartilaginous nose destroyed by lupus. A Dieffenbach's flap was cut from the forehead. The remaining skin from the nose detached and reflected downwards, so that the raw surface looked forwards and the skin backwards towards the nasal cavity ; the raw surface of this triangle then adapted to the forehead flap, so forming a portion of the skin lining the new nose. The lining completed by the flaps inverted to form the alæ. The whole new nose thus lined with skin obviating tendency to contraction. Forehead surface covered by flap of skin transplanted from the arm according to Wolfe's method.

CHEATLE.

251. SHEPPEGRELL'S patient, aged twenty-four, while making an attempt to clear his naso-pharynx, became dizzy. During several such attacks of vertigo he even lost consciousness for two to three minutes. There was also great pain over the right eye. The right nostril revealed an ecchondrosis of the septum and hypertrophy of mucous membrane, causing marked stenosis. The naso-pharynx exhibited chronic inflammation and was covered with thick secretion. The pain in the supra-orbital region of the eye was due to occlusion of the orifice of the right frontal sinus. The removal of the thickened cartilage and mucous membrane cured all conditions.

M. TOEPLITZ.

252. MAKUEN diagnosed the case of stammering in a boy as one of chorea of the facial, lingual, pharyngeal, and laryngeal nerves due chiefly to adenoids and partly to some deviation from the normal in the genio-hyo-glossus muscle and to defective vision. He removed the adenoids, divided the frenum linguæ well back, removed the elongated uvula, made the tongue protrude better by daily tractions, corrected the refractive error with glasses and ocular exercises prescribed by Dr. De Schweinitz, and augmented the entire effect of the successful operation by elocutionary drill.

M. TOEPLITZ.

253. Out of sixty cases of total synechia of the velum palati, collected from literature by KOLLBRUNNER, twenty-eight showed distinct marks of syphilis ; the others were uncertain or had no syphilis. The influences of oral breathing on the general system, the respiratory tract, the development of the face and upper jaw, the teeth, and the voice are discussed in detail. Finally the clinical histories of two cases are given, which had been operated

on by Kuhn. For after treatment a tube in connection with a palatal plate for introduction into the naso-pharynx is recommended.

HARTMANN.

254. HELLER states his opinion on the genesis of infectious diseases, already published in the *Muenchener med. Woch.*, 1894, that all infectious diseases are caused by inhalation. The first localization of the germs takes place in the nose and naso-pharynx (period of incubation and initial stage) with symptoms of local irritation, from which the absorption, *i. e.* the general infection, starts. In this view Heller employed a special method of treatment of infectious diseases for the last twenty-five years, which consists chiefly in the thorough cleansing of the naso-pharynx. The author also calls attention to the great importance of the nose and pharynx in regard to the pathogenesis and therapeutics of many other diseases, particularly for the local affections of the upper air passages, eczema of the face, various forms of neuralgia of the face (or frontal or occipital), of struma, probably also for the exophthalmic goitre and many cases of chlorosis.

HAENEL.

255. STICKER found on patients of the medical polyclinic at Giessen a frequent association of chronic dry pleurisy with chronic pharyngitis. In regard to etiology and clinical status these cases could be divided into two groups :

Group 1. Scrofulous or tuberculous individuals or those predisposed to tuberculosis. They showed chronic hyperæmia of the mucous membrane with granulations and hypertrophy of the lateral columns or diffuse hypertrophy of the entire pharyngeal mucous membrane with or without partial cicatricial atrophy.

Group 2 embraces persons with marked symptoms of acquired or hereditary syphilis, or in whom there is a strong suspicion of syphilis. The pharynx is simply dry or there is a diffuse atrophy of the lining of the pharynx. Detailed clinical histories are given for both groups. Then Sticker describes elaborately the idiopathic diffuse atrophy of the pharyngeal mucous membrane, "xerosis faucium," which is characterized by insufficient development and gradual disappearance of the whole lymphatic apparatus of the pharynx in contradistinction to the pharyngeal diseases of tuberculous persons. The atrophy supervenes simultaneously in the mucous, submucous, and muscular coats, and frequently spreads from its favorite place, the naso-pharynx, to the adjoining mucous membranes of the respiratory track, the nose and the

lungs. It is not the result of relapsing inflammatory swellings, as is often maintained, but primary and inflammatory processes develop from it as accidental complications; thus ozæna proper may complicate xerosis. Xerosis faucium creates a strong suspicion of syphilis, hereditary or acquired. Occupations and habits of life may bring about this transient curable dryness of throat in non-syphilitic persons, but in syphilitics they may be the incidental causes of incurable xerosis. HAENEL.

256. RUGE reports a case of primary tuberculosis of the right tonsil with secondary suboccipital Pott's disease, observed in the clinic of Gerhardt, and from a former record adds another case of Pott's disease with simultaneous swelling of tonsils, possibly also due to primary tuberculosis of the tonsils. Ruge examined the tonsils of 18 patients, selected at random, in order to get an idea of the frequency of tonsillar tuberculosis, and found tonsillar tuberculosis histologically in 5 cases besides the one described above. In no case the tuberculosis could be recognized microscopically; it presented the aspect of a simple catarrhal angina or tonsillar hypertrophy. In 2 cases the small and flat tonsil did not show anything striking. In all 5 cases there was simultaneous pulmonary phthisis; in 4 the infection of the tonsil came secondarily from the sputum, in 1 the tuberculosis of the tonsil was primary. Ruge thinks that primary tuberculosis of the tonsils is not rare in scrofulous children. This seems to be probable from the inoculations made by Dieulafois and the researches of Orth, who frequently found tubercles in diphtheritic tonsils of children, who were not affected with tuberculosis of the lungs. Primary infection of the tonsils may be derived from the food or the inhaled air; the secondary, from tuberculous sputum (most frequently), or through the blood or lymph.

HAENEL.

257. DEICHERT adds three cases of formation of bone or cartilage within the tonsils to the two of Orth. The bone or cartilage was situated at the periphery of the lymphatic substance, imbedded in tough connective tissue and growing towards the lacunæ. Deichert considers, with Orth, these formations as congenital portions of the second branchial arch, just like the pieces of cartilage and bone in the styloid ligament. In one of his cases both these formations were combined. These foci of cartilage and bone may be of practical importance, if they should give rise to formation of tumors by inflammatory irritation. HAENEL.

258. LACOARRET thinks that the hypertrophy was due to an infectious lymphadenic process, caused by the diphtheritic poison, not to inflammation. But how they should be discriminated is not mentioned. The tonsils, which at first touched each other in the median line, were reduced to normal size after $1\frac{1}{2}$ months' medical treatment.

ZIMMERMANN.

259. Both tonsils of a patient, aged twenty, were partially removed with the tonsillotome. Profuse hemorrhages from right tonsil after seven hours and again after nine hours, which were stopped with difficulty. After five days two more hemorrhages, which recurred on the eighth and thirteenth day after the operation. The right common carotid was ligated. On the two following days temperature of 40° C., convulsions of the limbs on the right side with paresis and deliria. These symptoms ceased on the seventh day.

GRADENIGO.

260. ARSLAN collected 110 cases of tumors of the tonsils from literature. Next to syphilitic cases sarcoma is the most frequent. Arslan reports his observation of angiosarcoma of the right and carcinoma of the left tonsil.

GRADENIGO.

BOOK REVIEWS.

I.—Dr. R. DREYFUSS (Strassburg) : **Die Krankheiten des Gehirns und seiner Adnexa im Gefolge von Naseneiterungen.** (The Diseases of the Brain and its Adnexa that Result from Nasal Suppurations.) Jena, Gustav Fischer, 1896.

Reviewed by Dr. O. Koerner of Rostock.

Dreyfuss has searched literature very thoroughly and has collected the cases of diseases of the brain due to suppuration in the nose or its neighboring cavities. It is to be hoped that this comprehensive book will draw attention to a neglected field. What we need to begin with are reports of cases which show accurate observation. The author deserves credit for his care in arriving at conclusions from such limited material. The lesson which this book teaches is of the greatest importance to rhinologists.

II.—Dr. L. YANKAU : **Vademecum und Taschenkalender für Ohren-, Nasen-, Rachen- und Halsärzte auf die Zeit April 1896 bis März 1897.** (Vademecum and Pocket Calendar for Ear, Nose, and Throat Specialists, from April, 1896, to March, 1897.) Leipzig, Eduard Heinrich Meyer.

Reviewed by Dr. Arthur Hartmann of Berlin.

It is difficult to estimate how much necessity there is for a pocket-calendar for ear, nose, and throat specialists ; its success will be the only means of deciding. The practice of these specialties is carried on in offices and not at the homes of patients, and for this reason the necessity for such a note-book seems doubtful. Nevertheless, it may prove useful to have in convenient form, briefly arranged data of the latest experiences and measures, and especially the dosage of therapeutic remedies.

In the calendar before us the author has not limited himself to the field expressed by the title, but has included the connection

between these specialties and general medicine, believing that even the specialist must be prepared to render rapid assistance in certain emergencies. Hence the chapters include first aid to the injured, poisoning and its treatment, and the maximum doses of therapeutic remedies. The contents which appeal to the specialist are the following: Anatomical, physiological, pharmacological, and toxicological data, disinfection of the hands, the present status of serum-therapy, and the most recent additions to medicinal agents used in the treatment of diseases of the ear, nose, and throat. A chapter is devoted to the cure of deaf-mutism by methodical acoustic exercises. The most general and the most incomplete chapter is the one which treats of ear, nose, and throat symptoms and their diagnostic importance in diseases of the nervous system. That portion of this chapter which refers to the ear reads as follows: "We distinguish diminution in hearing (Hypacusis), increase (Hyperacusis), and loss (Anacusis). These occur not only in diseases of the middle and internal ears, but also in hysterical hemianæsthesia, and the examination is to be extended in these directions."

The calendar is not likely to be used extensively unless subjected to a thorough revision. The first edition presents many defects and errors to which the author himself calls attention in the preface; a new edition is, therefore, quite essential; when improved in this respect, we do not doubt that it will find its way into use.

The list of the various ear, nose, and throat specialists practising in Germany is useful but quite incomplete; it ought to be made to correspond to the English medical directory in which the course of study and important works of each specialist are given. In addition, the names of physicians residing in watering-places and sanitary resorts, who are identified with these specialties, would be most desirable.

III.—Dr. HUGO HESSLER (Halle): **Die otogene Pyämie.** (Otogenic Pyæmia.) With 7 figures and 26 tables. Jena, Gustav Fischer, 1896.

Reviewed by Dr. A. Scheibe, of Munich.

The thoroughness with which this subject has been discussed by numerous authorities within the past few years precludes any great exhibition of progress in a new monograph; nevertheless, Hessler's treatise adds materially to our knowledge in this field, in certain directions, and gives evidence of great industry and depth.

It is not only the most extensive work, but also the richest in material, of any which treat of pyæmia; it includes an account of anatomical relations involved and the study of pyæmia in general.

Pathological anatomy has been gone into very deeply, the author having very properly realized the possibility of presenting a more complete picture in this chapter than in that treating of symptomatology, which is handicapped by lack of precision in published histories of cases. On this account it seems doubtful whether it was wise to regard every case as of equal importance, and whether, with material varying so much in value, it would not have been better to weigh it more carefully before utilizing it.

Too little stress has been laid upon the fact that sinus thrombosis can run its course without symptoms. In a work so carefully written in other respects, a defect of this sort becomes more pronounced because it tends to increase the uncertainty already existing in this matter. Thus, Hessler considers those instances of pyæmia which recover without operation to be identical with the cases of osteophlebitis, in contradistinction to sinus phlebitis; there is certainly no justification for this view, since both spontaneous recovery from sinus phlebitis and a course without symptoms are known to occur, and probably do occur more frequently than autopsies lead us to believe. On this account, it is not yet possible, with our present knowledge, to establish a differential diagnosis between pyæmia with sinus phlebitis and pyæmia unaccompanied by it. It is possible merely to differentiate between the light and the severe forms of otogenic pyæmia—which distinction Hessler unconsciously makes,—although we must remember that the fatal cases are almost exclusively examples of sinus phlebitis. There would seem to be more justification for differentiating between cases of pyæmia complicating acute suppurations of the middle ear and those occurring with chronic aural suppurations; here there exist rather marked differences, as Hessler's work also shows. However, it would be necessary to be very critical in distinguishing between these two groups; cases of acute suppuration with purulent degeneration of the thrombus would be likely to give rise to doubt.

In the chapter on the prophylactic treatment of pyæmia, *i. e.*, the treatment of acute and chronic suppurations of the middle ear, Hessler departs from his resolution to utilize previous experiences in as objective a manner as possible, and devotes a

relatively large amount of space to theoretical conclusions—a departure of very doubtful value.

On account of the detailed descriptions of cases scattered throughout the entire book, the monograph is adapted more as a work of reference than for casual reading. In the preparation for a second edition, it might be well to omit the partial repetition of fatal cases added to the various chapters; an increased circulation would certainly follow such a change.

IV.—THOS. BARR (Glasgow): **Manual of Diseases of the Ear**, including those of the Nose and Throat in relation to the Ear. Second edition. Jas. Maclehose & Sons, Glasgow, 1896 (The Macmillan Co., 66 Fifth Ave., New York. Price \$3.50).

Dr. Barr's text-book appears in a new garb, large-octavo, instead of small-octavo, as in the first edition in 1884. Paper, presswork, and illustrations (these have doubled) are of the best, and the style is easy, clear, and concise. It is a manual *comme il faut* for the student and practitioner, avoiding all uncertainties and speculations, but presenting the rich contents of modern otology in a lively, attractive, and impressive manner, testifying that its author is not only fully conversant with his subject, but that he has been one of the promoters of the recent marvellous progress in the science and art of this department of medicine. His work, in conjunction with WM. MACEWEN, in the mastoid and intracranial complications of middle-ear disease is unexcelled. The 386 pages of text, with 229 handsome illustrations, a formulary, a very detailed index, and a bibliography, contain all the student wants to learn, the aural practitioner need know, and the teacher and specialist like to read, in order to refresh their memory and familiarize themselves with the discoveries and inventions of recent years fittingly inserted into the proper places of our old acquired stock of knowledge.

H. K.

MISCELLANEOUS NOTES.

APPOINTMENTS.

McKEOWAN, W. A., M.D. Ireland, M. Ch., has been appointed Lecturer on Ophthalmology and Otology, Queen's College, Ireland.

Prof. A. BARTH, formerly in Marburg, at present in Breslau, has accepted the offer of the Professorship of Otology at the University of Leipzig.

Dr. T. C. EVANS has been appointed Professor of Ophthalmology, Otology, and Laryngology at the Kentucky School of Medicine of Louisville.

THE BRITISH LARYNGOLOGICAL, RHINOLOGICAL, AND OTOLOGICAL ASSOCIATION.—The following have been elected office-bearers for the ensuing year : President : Dr. W. Milligan (Manchester) ; Vice-Presidents : Dr. J. Middlemass Hunt (Liverpool), Mr. F. Marsh (Birmingham), Mr. E. C. Hilkin (London).

The late Mr. GEORGE STACKEY LEAN, J.P. for Somerset, of Lyde House, Bath, has left £100 to the Bath Ear and Eye Infirmary.

Contents of the latest numbers of the *Zeitsch. f. Ohrenhk.*

Vol. XXIX., Nos. 1 and 2. Issued August, 1896.

1. FR. BEZOLD. The Present Status of our Auditory Tests. Translated in the July number of this volume.
2. F. SIEBENMANN. The Central Auditory Tract and its Sufferance from Tumors of the Mid-Brain. Illustrated.
3. O. KOERNER. Case of Chloroma of both Temporals, both Sigmoid Sinuses, and both Orbits.
4. J. DUNN. Aspergillus Glaucus in the Human Nose. Translated from the English Edition.
5. O. BRIEGER. Otitic Pyæmia. Translation in this number.
- 6 and 7. Reports of Societies, and Reviews. All translated.

Vol. XXIX., No. 3. Issued September, 1896.

8. J. MORF. Otitic Abscesses Occipital Lobe.
9. AD. LEVY. Report on the Otological Clinic in Copenhagen.
10. O. KÖRNER. Note on the Symptoms of Phlebitis of the Cavernous Sinus.
11. J. HEGETSCHWEILER. Bezold's Mastoiditis with Pyæmia.
12. R. ABBE. Carotid-Hemorrhage from Middle-Ear Necrosis. Translated from the English Edition.
- 13 to 15. Society Reports. Translated in this number.
- Report on the Progress of Otology in the Second Quarter of 1896. Translated in this number.
- Book Notices.

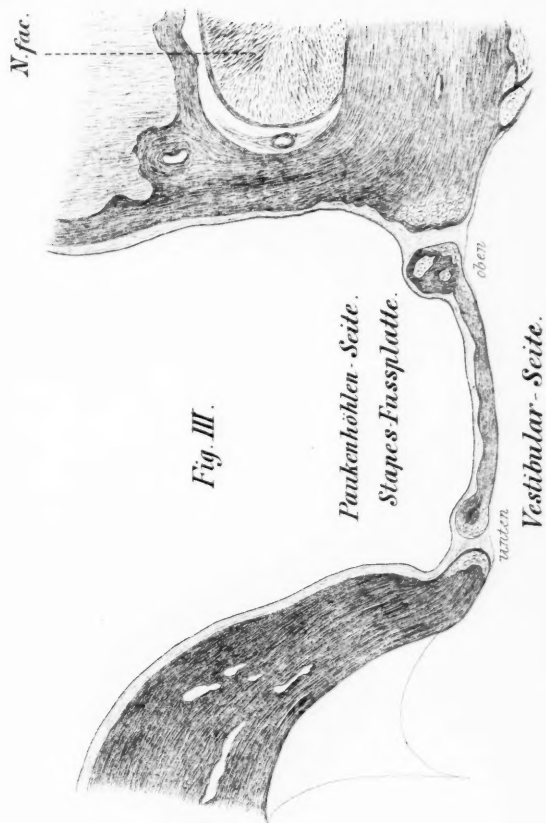
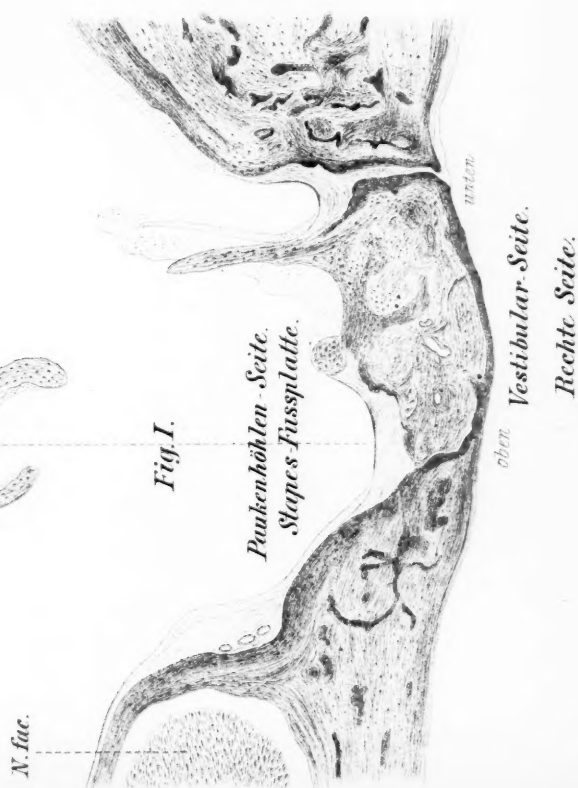
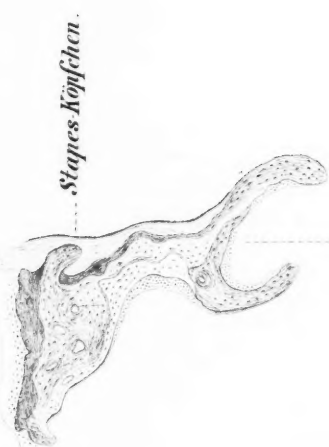
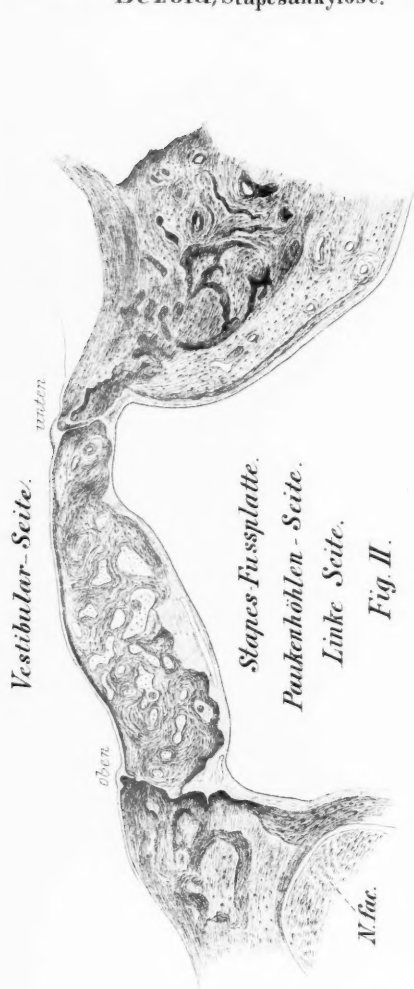
INDEX OF SUBJECTS AND AUTHORS. VOLUME XXV.

- ABBE, A Case of Carotid Artery Hemorrhage with Middle-Ear Necrosis, 1
- Adenoid Vegetations, Notes on History of, 228, 280, 324
- Æsophagus, Rupture of, Following Otitis Suppurativa, 434
- ALDERTON, The Upper Tone-Limit in the Normal and Diseased Ear as Determined by Galton's Whistle, 43; The Operation of Mastoid Antrotomy for the Cure of Obstinate Otorrhœa, 255
- American Laryngological, Rhinological and Otological Society, Report of Meeting of, 244
- Anatomy, Report on, of the Ear, 197, 413
- Antrotome, A New Instrument, 255
- Antrum, Cases of Disease of the Maxillary, 327
- Aphasia and Otitic Brain Abscess, 112
- Atresia of Auricle, The Hearing Power in Cases of Congenital, 127
- Auricle, Epithelioma of the, 146
- Austrian Otological Society, Report of the, 385
- BACON, G., A Case of Otitis Media Followed by an Abscess in the Temporo-Sphenoidal Lobe, Operation, Death, 249
- BARR, "Manual of Diseases of the Ear, Including those of the Nose and Throat in Relation to the Ear," 465
- BEZOLD, A Further Case of Anchylosis of the Stapes, Diagnosed during Life, with Autopsy, 67; On the Present Status of the Various Tests for Hearing, 274; The Hearing Power in Cases of Bilateral Congenital Atresia of the Auditory Canal with Rudimentary Auricle, 127; "The Power of Hearing in Deaf-Mutes, with Special Reference to Helmholtz's Theory of the Seat of the Disease, and of the Instruction of Deaf-Mutes," Notice of, 235
- Brain, Diseases of, from Otitis Suppurativa, 104, 112, 198, 216, 249, 300
- BRAISLIN, A Case of Living Larvæ in the Ear without Previous Suppuration, 51
- BRIEGER, "Clinical Contributions to Otology," Notice of, 230; On General Pyæmic Infection Following Aural Suppuration, 343
- Broca and Maubrac, "Cerebral Surgery," Notice of, 338
- Cerebellum, Abscesses of, from Otitis Suppurativa, 4
- CHEATLE, The Mastoid Antrum a Part of the Middle Ear, 271

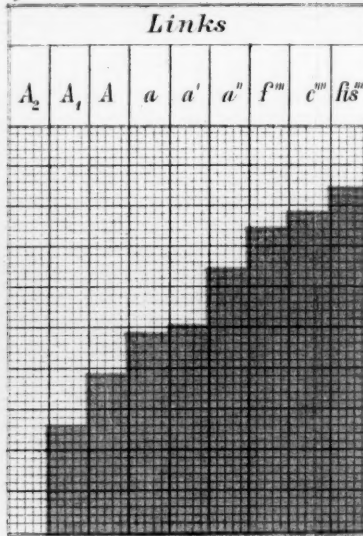
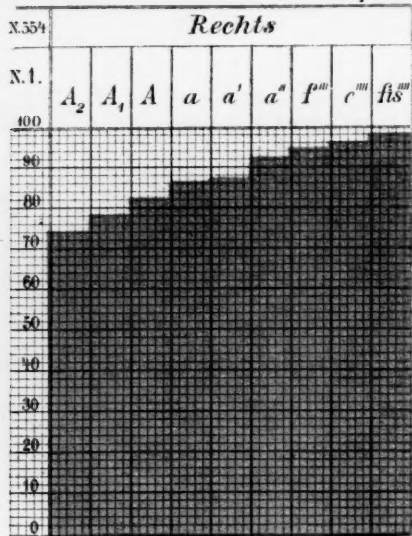
- Cholesteatoma, Papers on Diagnosis and Treatment of, after Otitis Purulenta, 132, 215, 375
- Cocain, Acute Poisoning from Use of, in Ear Diseases, 292
- Coryza, Bicarbonate of Soda in, 310
- DENKER, A Case of Epithelioma of the Cartilaginous and Cutaneous Meatus and Auricle, 146
- Divers, The Ears and Hearing of, 202
- DOWNIE, A Case of Acquired Total Deafness, the Result of Inherited Syphilis, 37
- DREYFUSS, "Diseases of the Brain and its Adnexa as a Result of Nasal Suppuration," Notice of, 462
- Dutch Laryngo-Rhino-Otological Congress, Report on, 410
- Ear, Diseases of the, from Syphilis, 291
- Ear-Reflexes, from the Eyes, 292
- Epistaxis, Prescription in Cases of, 117
- Equilibrium, Disturbances of, in Ear Diseases, 8
- Facial Paralysis, Case of, in Course of Acute Catarrh, 186; in Non-Suppurative Otitis, 427
- Fifth International Otological Congress, Report of Transactions of the, 74
- Foreign Body in Ear, Cases of Removal of, with Suggestions, 295; Death from Bad Method of Attempted Removal, 102; In Nose, 413, 453; Removal of, from Tympanum by Operation, 186
- Gangrene of the Ear, 429
- German Naturalists and Physicians, Report on Otological Section of the 66th Congress of the, 192
- Granulations, Treatment of, in the Ear, 49
- Hearing, Duration of, throughout the Musical Scale in Diseases of the Inner and Middle Ear, 152; Present Status of Tests for the, 274
- HESSLER, "Otogenic Pyæmia," Notice of, 463
- Highmore's Antrum, Diseases of, 225
- Hungarian Otological and Laryngological Congress, Report of, 182
- Influenza, Otitis, 210
- Instruments, New, for Nose and Throat, 100
- Instruments and Remedies, Report on, 200, 293, 422
- Iodine, Tincture of, in Aural Suppuration, 105
- JANSEN, "Experiences in Sinus Thrombosis after Otitis Purulenta in 1893," Notice of, 239
- KNAPP, Further Observations on the Indications for Mastoid Operations in Acute Purulent Otitis Media and its Complications, 58
- KOERNER, "The Otitic Diseases of the Brain, Meninges, and Blood-Vessels," Notice of, 231
- Labyrinth, Apoplectiform Diseases of the, in Caisson Workmen, 406
- LAKER, A New Method of Dealing with the External Meatus in Operations on the Mastoid, 268
- Larvæ in the Ear without Previous Suppuration, 51, 206
- Mastoid, "Anatomical Papers on, 271; Condition of, in Otorrhœa, 432, 434; Further Indications for Operations on the, in Purulent Otitis Media, 58; Neuralgia of the, cured by Operation, 188; Operations on the Antrum of the, 255; Ostitis of, Simulating Trigeminal Neuralgia, 398
- Mastoid Cases, Series of, 106, 212
- Measles, The Ears in, 290

- Meatus, Foreign Body in, Proceeding from Mouth, 206; A New Method of Dealing with the, in Mastoid Operations, 268; Primary Carcinoma of the, 146, 188
- Membrana Tympani, Bullæ on the, 296; Closure of Cicatrices, in the, 407
- Ménière's Symptoms after Traumatism of Labyrinth, 398
- MICHAEL, "The Treatment of Otitis Purulenta," Notice of, 236
- Middle Ear, Acute Inflammation of the, Produced by *Bacillus Pyocyaneus*, 149; Disease, Followed by Carotid Artery Hemorrhage, 1; Operative Exposure of the, 402, 435; Two Cases of Sarcoma of the, 262; Various Forms of Disease of the, 208
- MILLIGAN, A Case of Temporo-Sphenoidal Abscess after Ear Disease, 265; Two Cases of Sarcoma of the Middle Ear, 262
- Nasal Accessory Cavities, Treatment of the, 449
- Nose and Naso-Pharynx, Report on the Anatomy, Histology, and Physiology of the, 96, 114, 221, 305, 442
- Nose, Polypi of the, 224; Tuberculoma of the, 187
- Ossicles, Operations on the, 213; Results of Operations on, not Favorable, 428
- Otitic Intracranial Affections, Statistical Paper on, 401
- Otitis Purulenta, Bacteriology of, 139; Diagnosis and Treatment of Cholesteatoma after, 132; Fatal Cases of, 439; Operations for Cure of, 190, 431
- "Otology in the Age of Hippocrates," Notice of, 242
- Oxygen Gas in Ozaena, 289
- Ozaena, Serum-Treatment of, 448
- Pathology and Therapeutics, Report on, 98, 200, 285, 421
- PES and GRADENIGO, A Contribution to the Study of Acute Inflammation of the Middle Ear Produced by the *Bacillus Pyocyaneus*, 149
- Physiology, Report on, 198, 420
- Politzer's Atlas, Notice of New Edition of, 336
- Polypi, Treatment of, 49
- PRITCHARD, The Treatment of Polypi and Granulations, 49
- Psychic Deafness, 396
- Pyæmia, General, Following Aural Suppuration, 343, 371, 397
- REDMER, On the Spontaneous Recovery of Cholesteatoma and Cholesteatomatous Affections of the Temporal Bone, 375
- Report on the Progress of Otology, 96, 197, 285, 414
- Retropharyngeal Abscess, 455
- Reviews and Book Notices, 231, 336, 462
- ROBERTS, A Case of Papilloma of the Tonsil, 55
- ROPKE, A Case of Pyæmia after Acute Suppuration of the Ear, Operation, Recovery, 371
- SCHEIBE, A Contribution to the Diagnosis and Treatment of Cholesteatoma in Otitis Purulenta Chronica, 132
- SEXTON, Obituary Notice of Dr. Samuel, 341
- Sinus, Diseases of the Frontal, 226
- Sinuses, Reports of Various Diseases of the Nasal Accessory, 316
- Sinus Phlebitis, 185
- Stammering, New Method of Treating, 293
- Stapes, A Further Case of Anchylosis of the, Diagnosed during Life, 67
- STERN, Contributions to the Bacteriology of Otitis Purulenta, 139
- Syphilis, Total Deafness from Inherited, 37

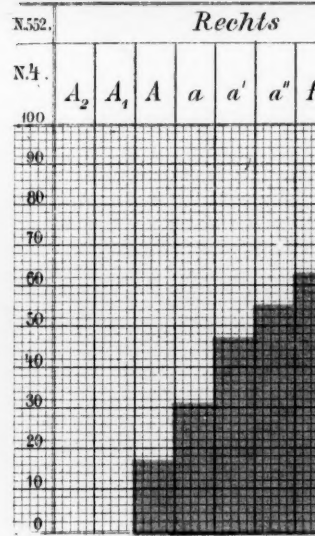
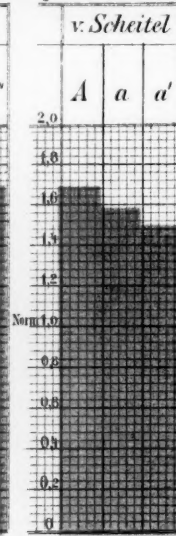
- Temporo-Sphenoidal Abscess, Cases of, 249, 265
- Tinnitus, Objectively Perceptible, 99, 189, 290; Coniine Hydrobromate in, 201
- Tone-Limit, The Upper, as Determined by Galton's Whistle, 43
- Tongue, Angioma of the, 331
- Tonsil, a Case of Papilloma of the, 55; Bone in the, 460; Diseases of the, 229; Papers on Hypertrophy of the, 322; Sarcoma of the, 118
- Tuberculosis of Larynx and Ear, 202
- Turbinates, Removal of the Inferior, 191
- Tympanum, Experiments on Irrigation of the, 194; Operations for opening the, in Otitis Purulenta Acuta or Chronica, 214
- URBANTSCHITSCH, "On the Use of Hearing Exercises in Deaf-Mutes and on Deafness in the Later Years of Life," Notice of, 232
- Velum Palati, Synechiæ of the, 458
- VON STEIN, On the Disturbances of Equilibrium in Diseases of the Ear, 8
- WERHOVSKY, Examination of the Duration of Hearing throughout the Musical Scale in Diseases of the Internal and Middle Ears, 152
- Wernicke's Symptom, 436
- WOODWARD, Purulent Otitis Media with Fatal Cerebellar Abscess, 4
- Xerostomia, Reports of Cases of, 330
- YANKAU, "Vade-Mecum for Ear, Nose, and Throat Specialists," 462
- ZWAARDEMAKER, Acoustic Railway Signals and Acuteness of Hearing, 385



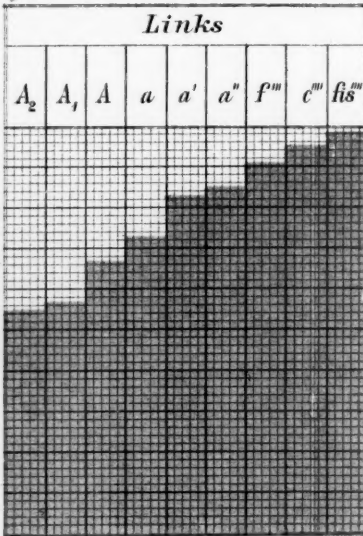
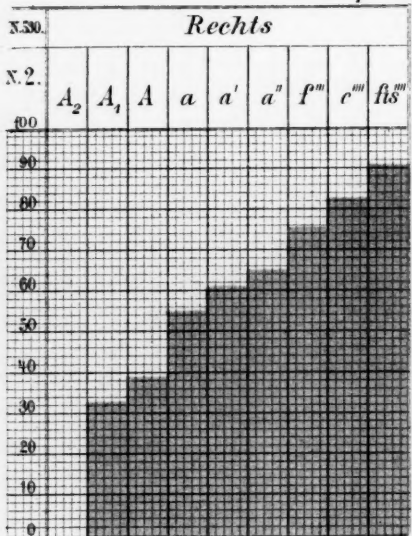
per Luft.



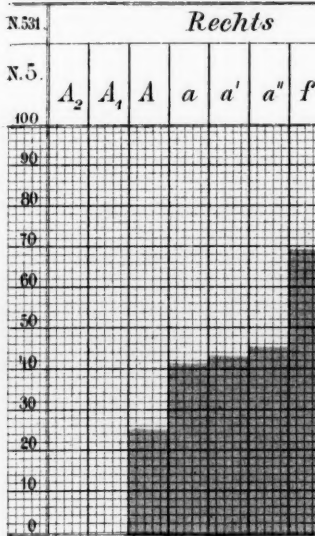
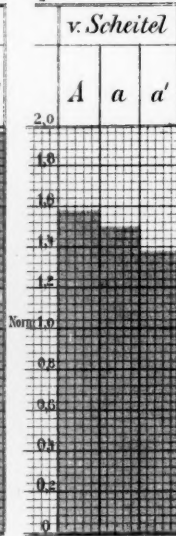
per Knochenl.



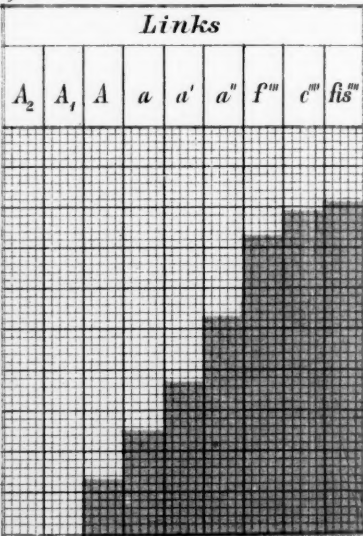
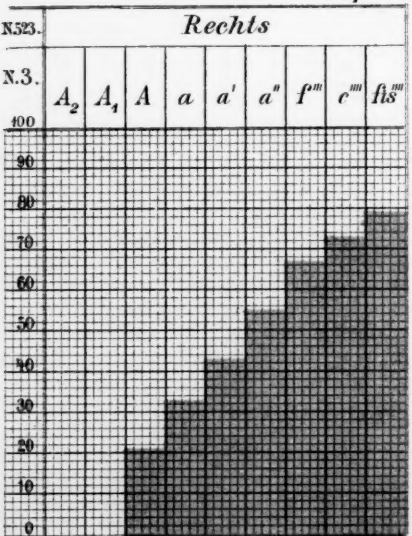
per Luft.



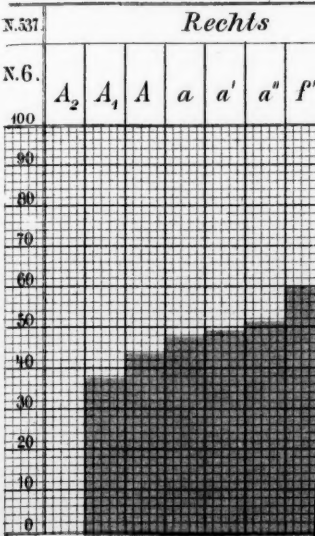
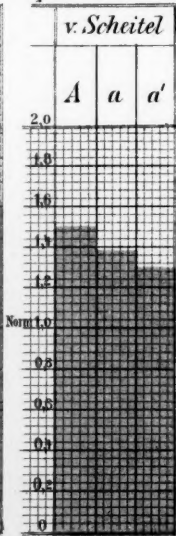
per Knochenl.

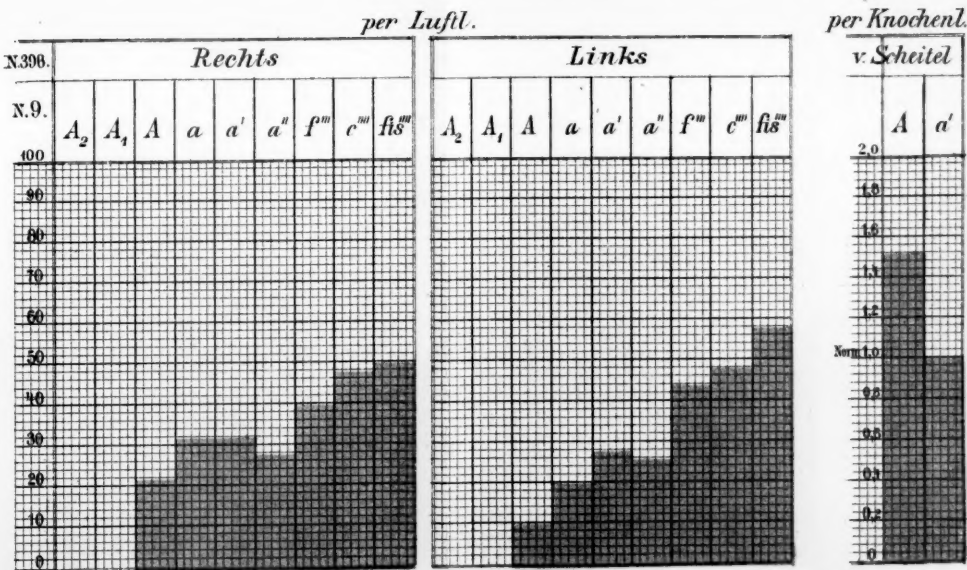
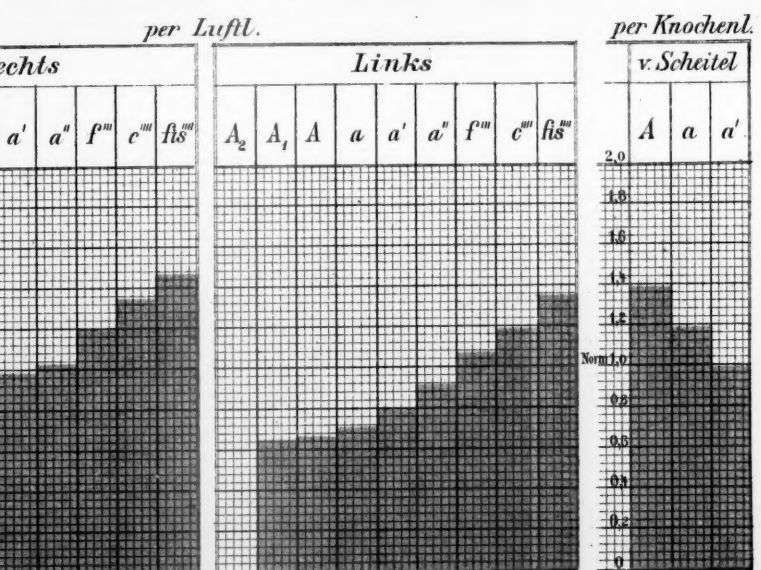
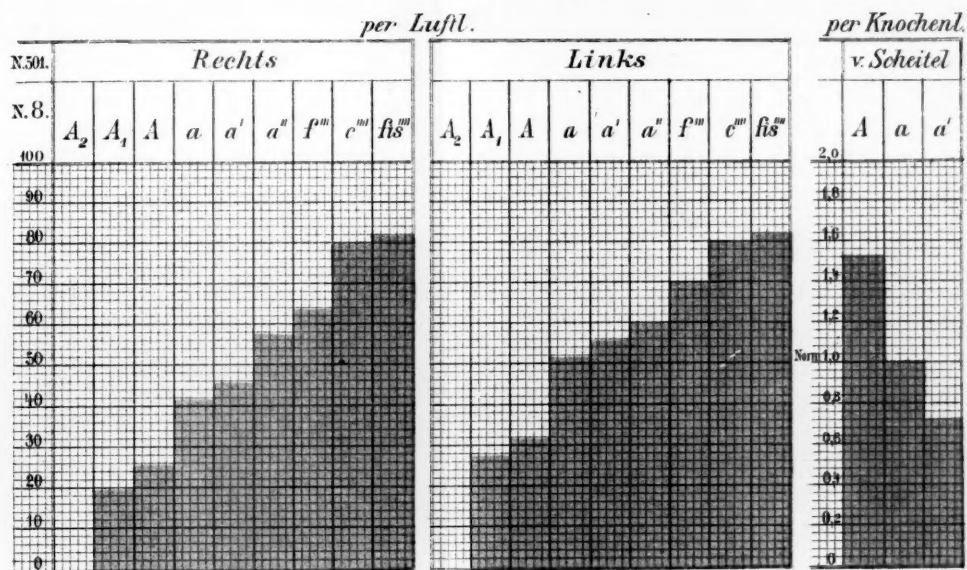
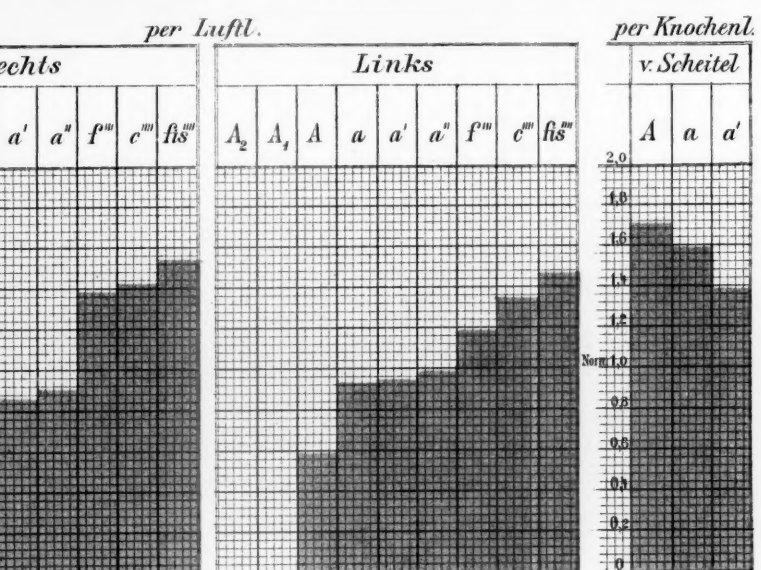
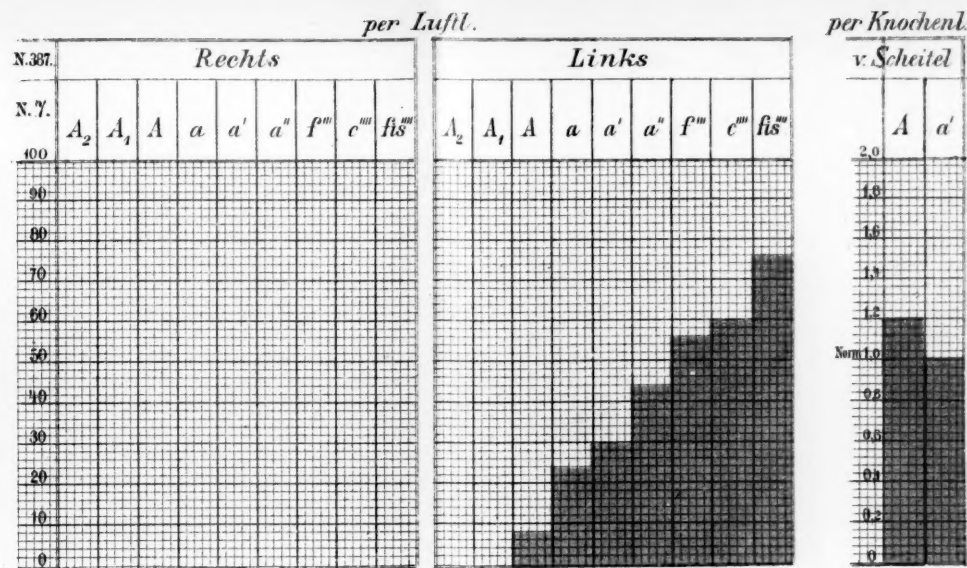
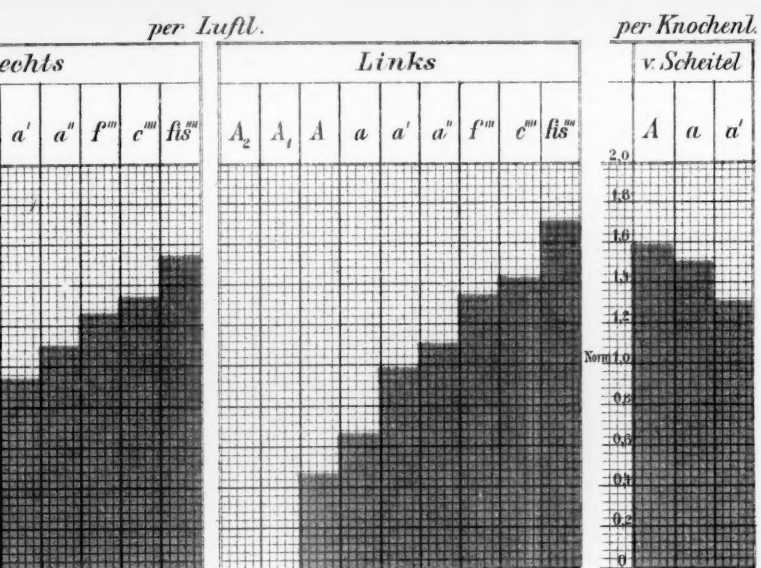


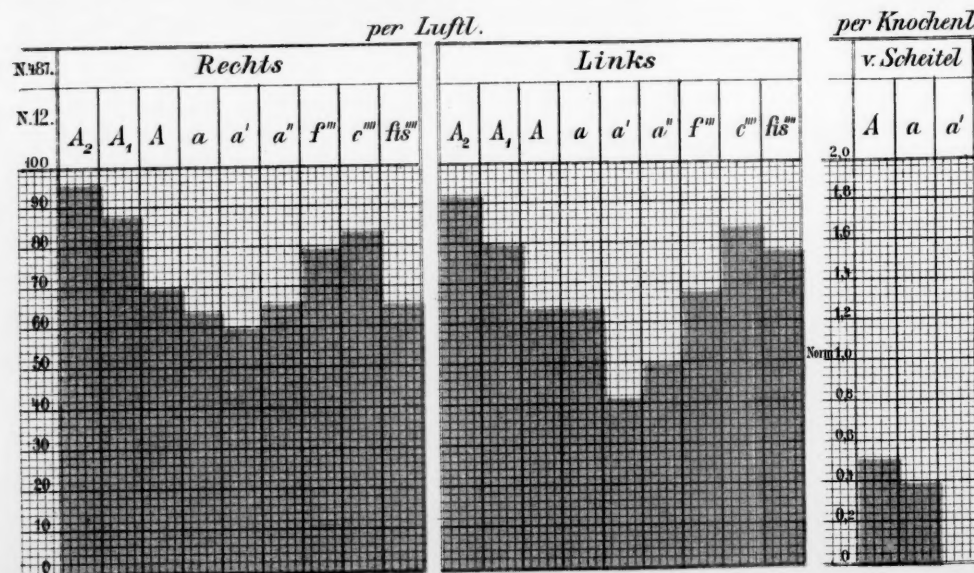
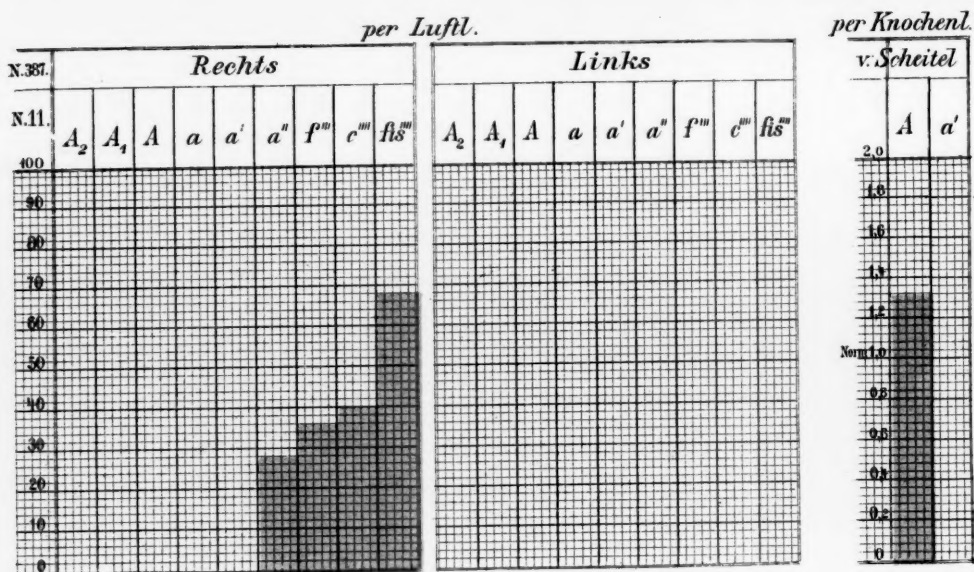
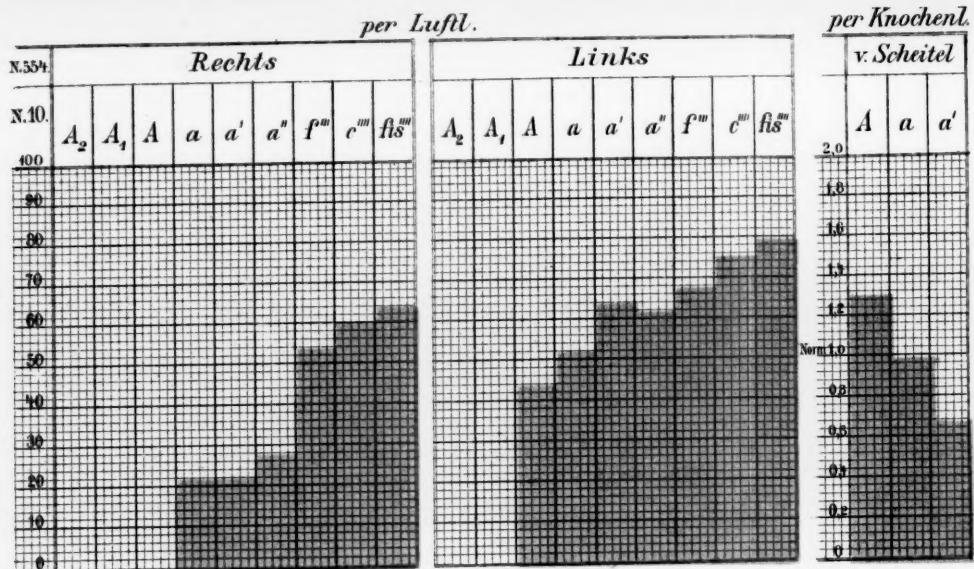
per Luft.

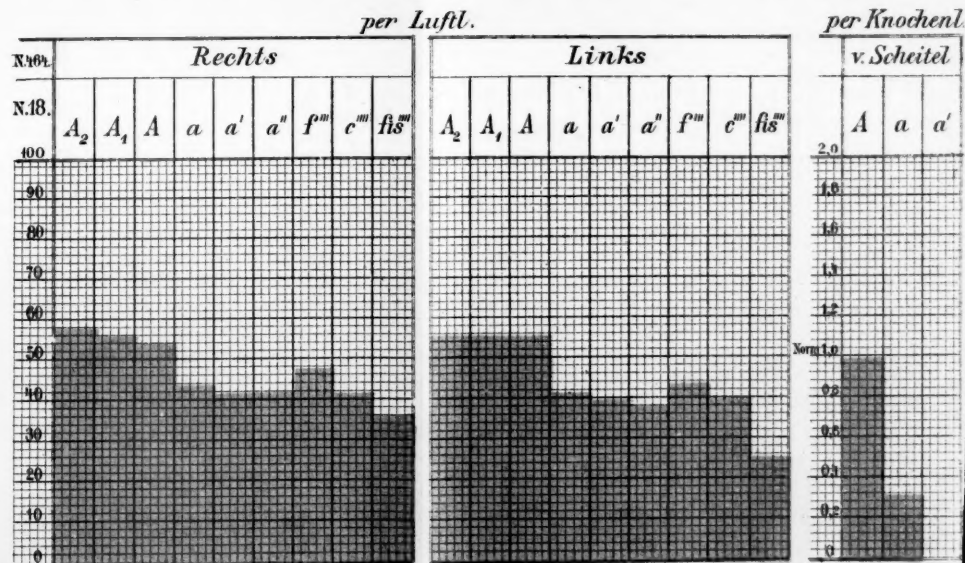
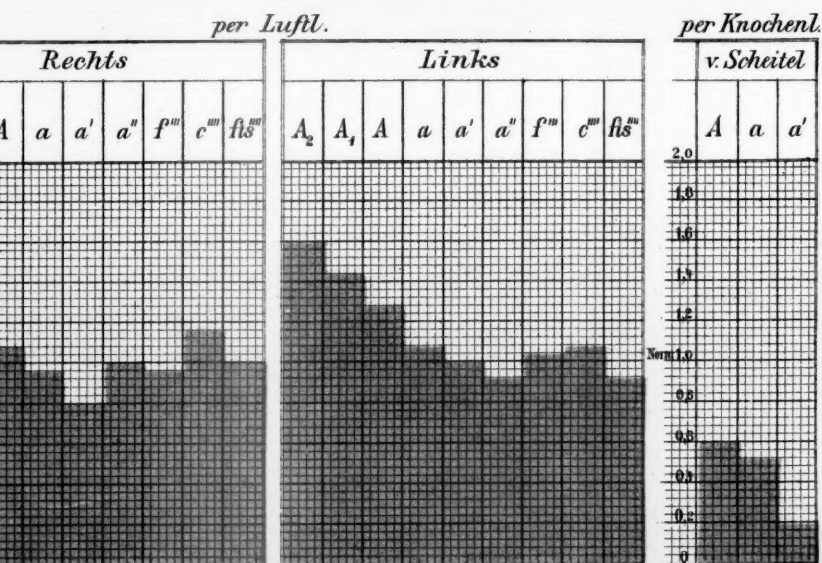
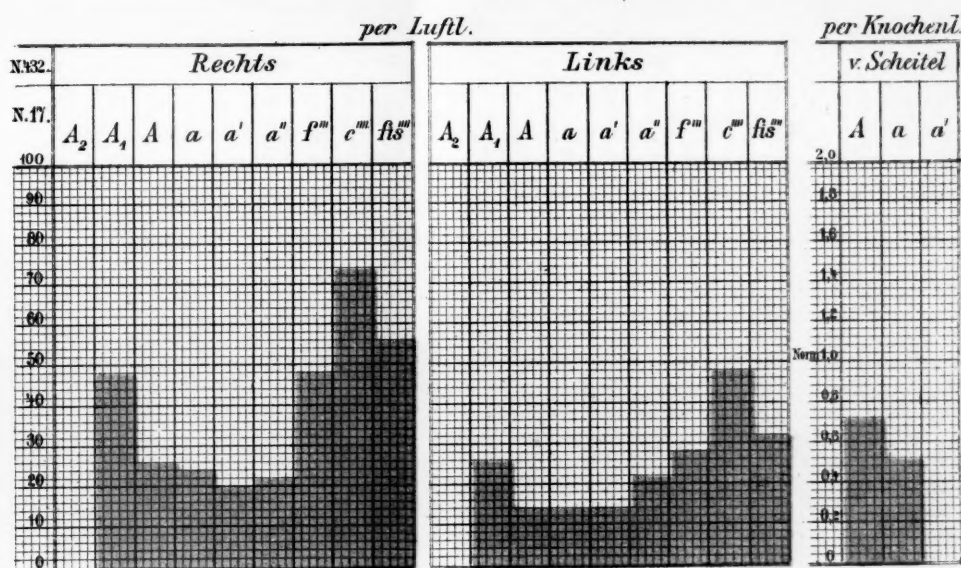
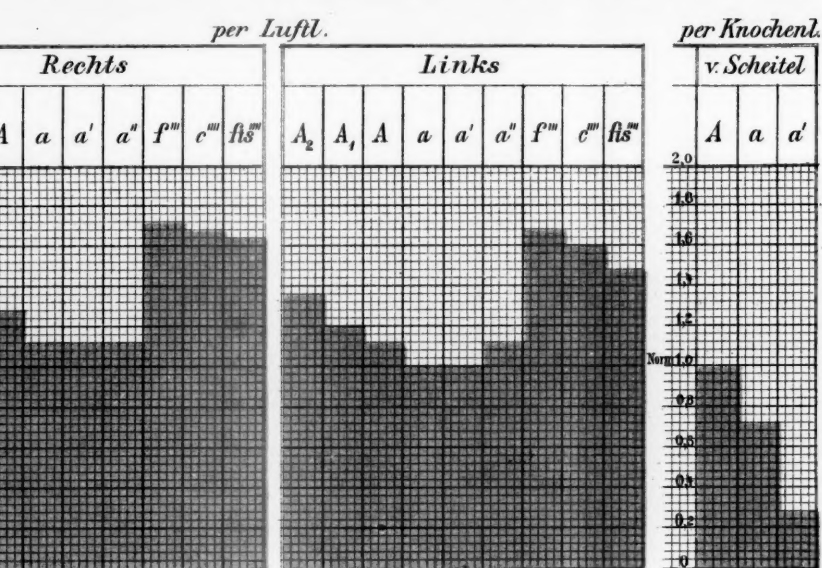
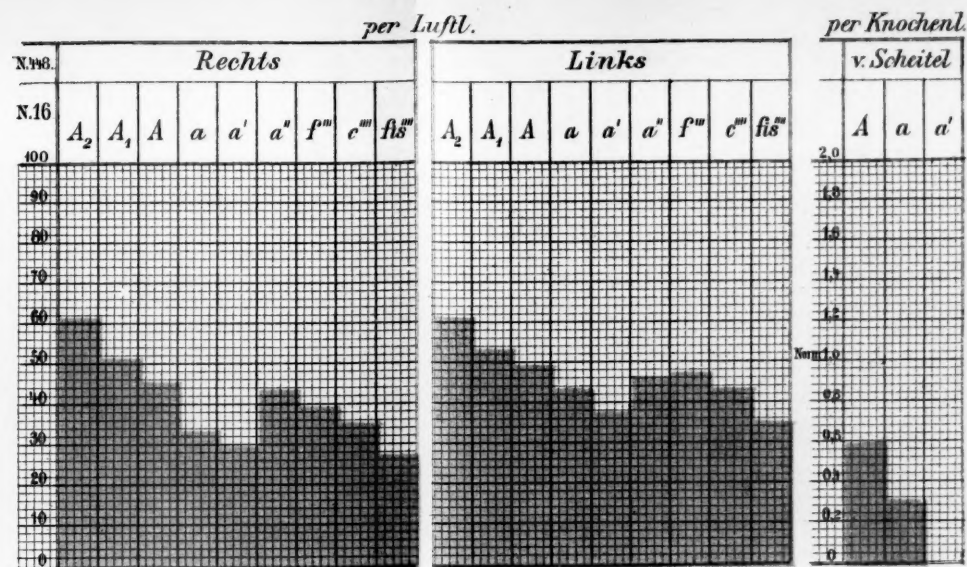
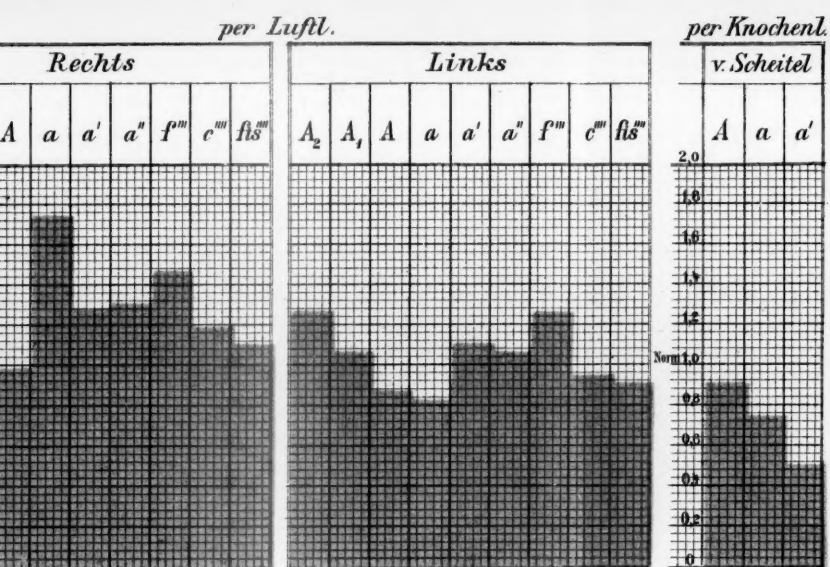


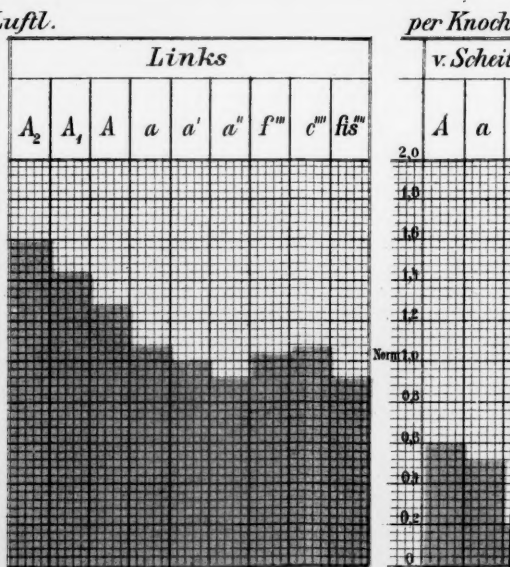
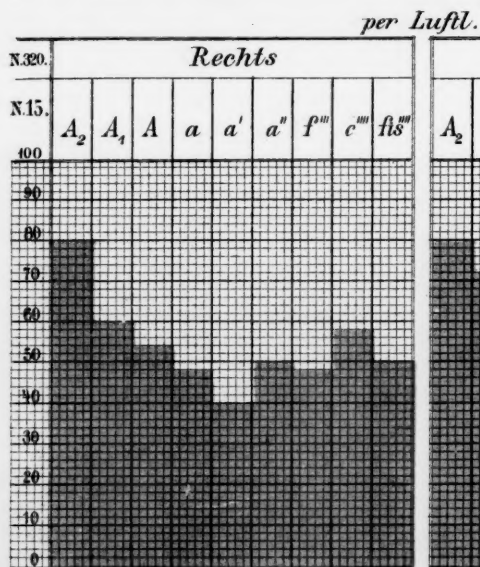
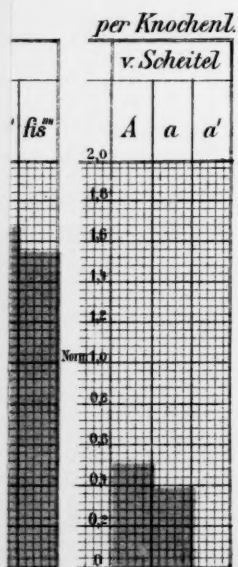
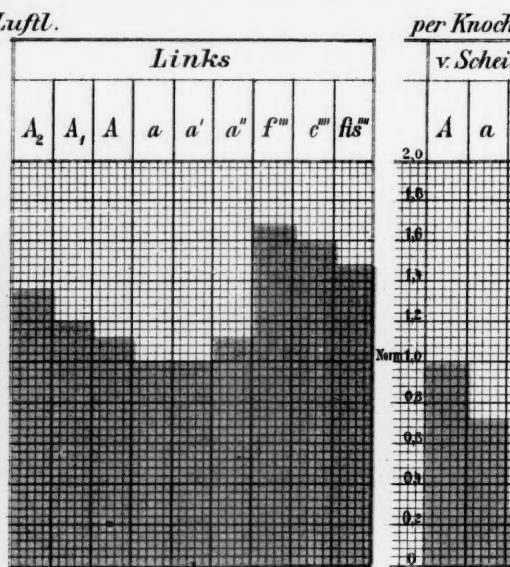
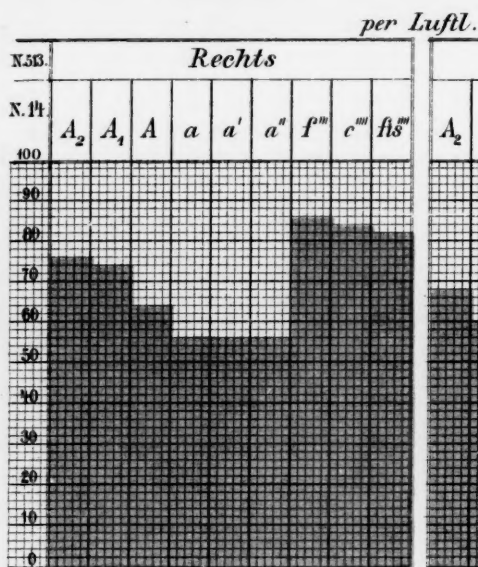
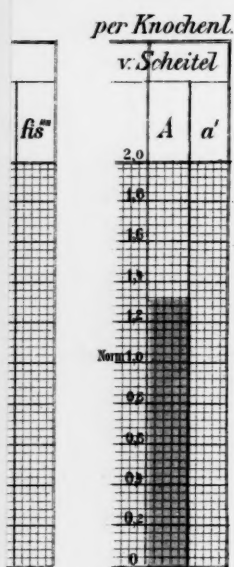
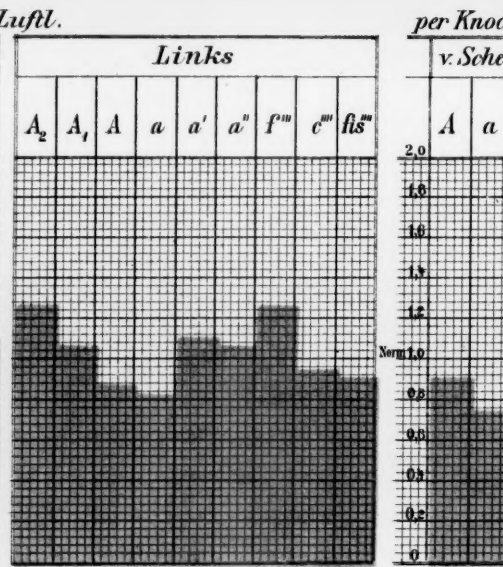
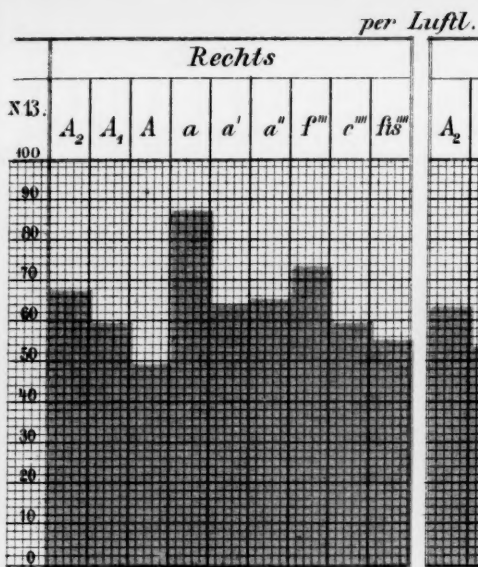
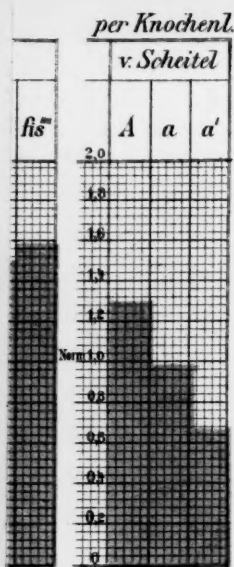
per Knochenl.



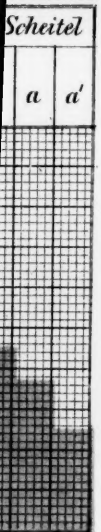




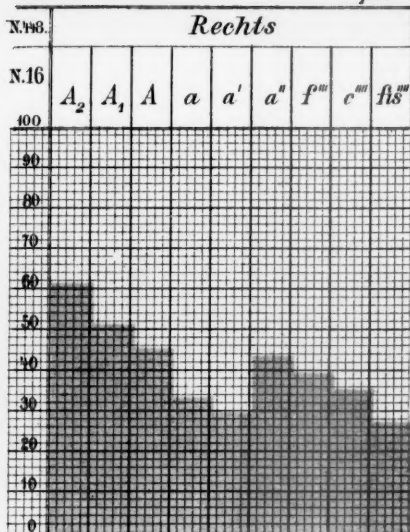




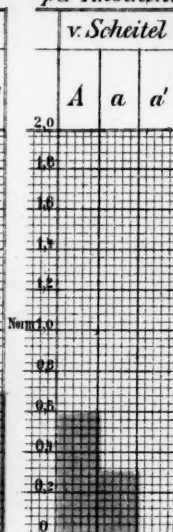
Knochenl.



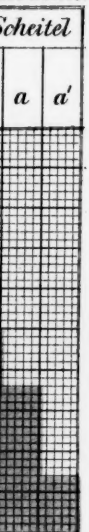
per Luftl.



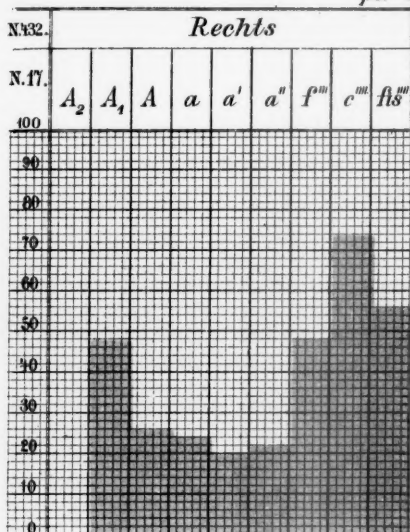
per Knochenl.



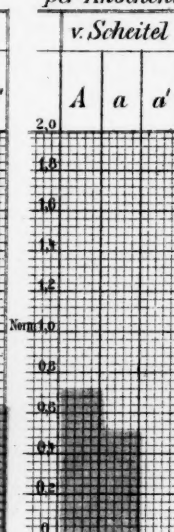
Knochenl.



per Luftl.



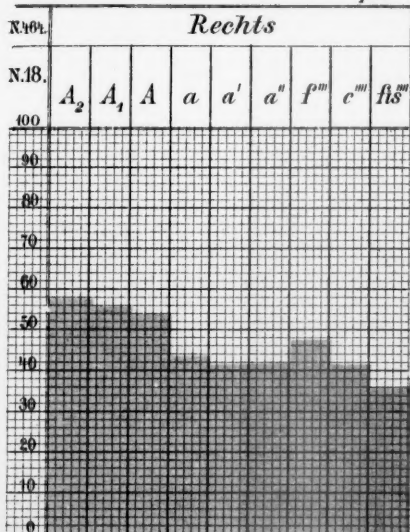
per Knochenl.



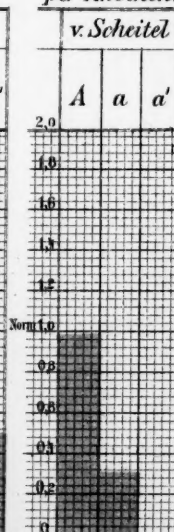
Knochenl.

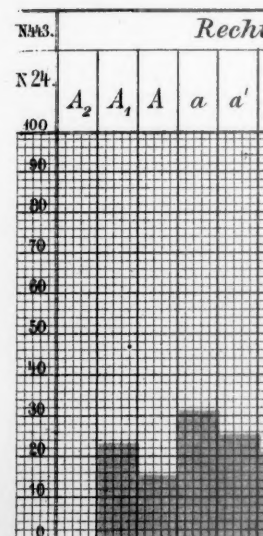
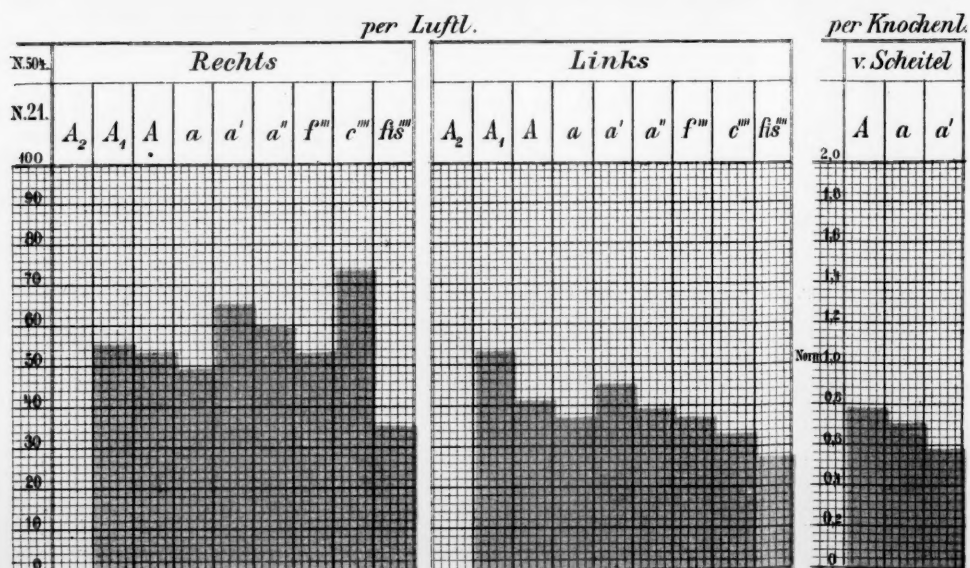
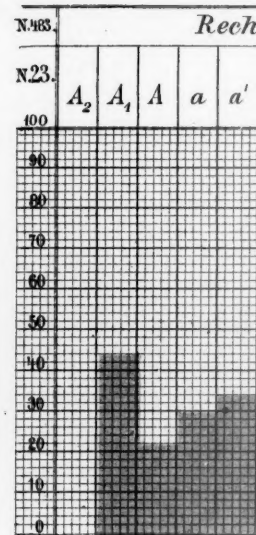
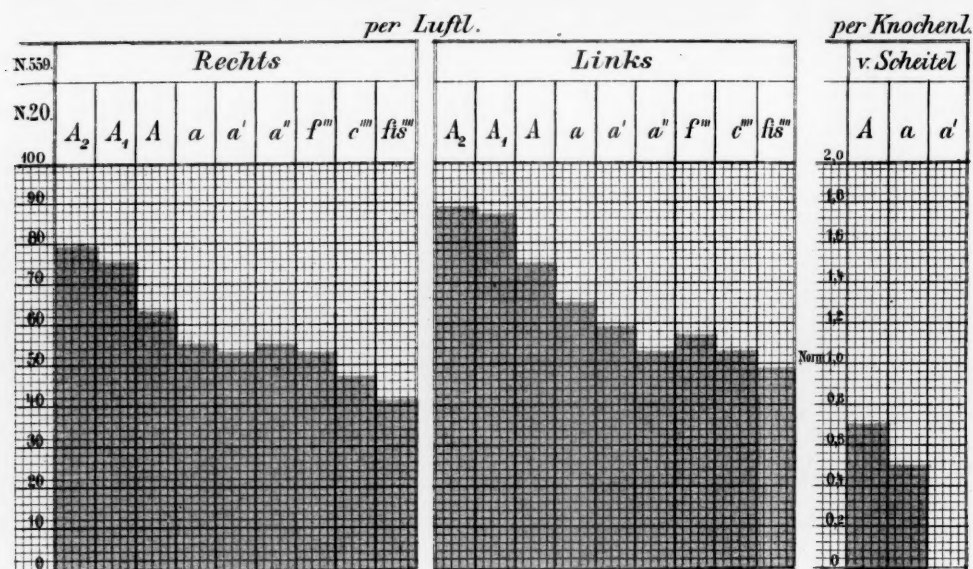
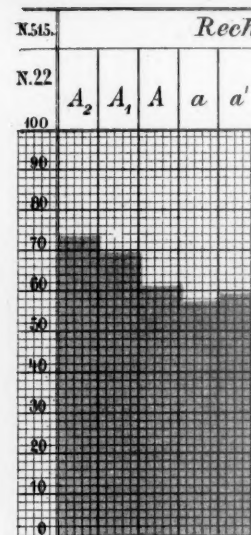
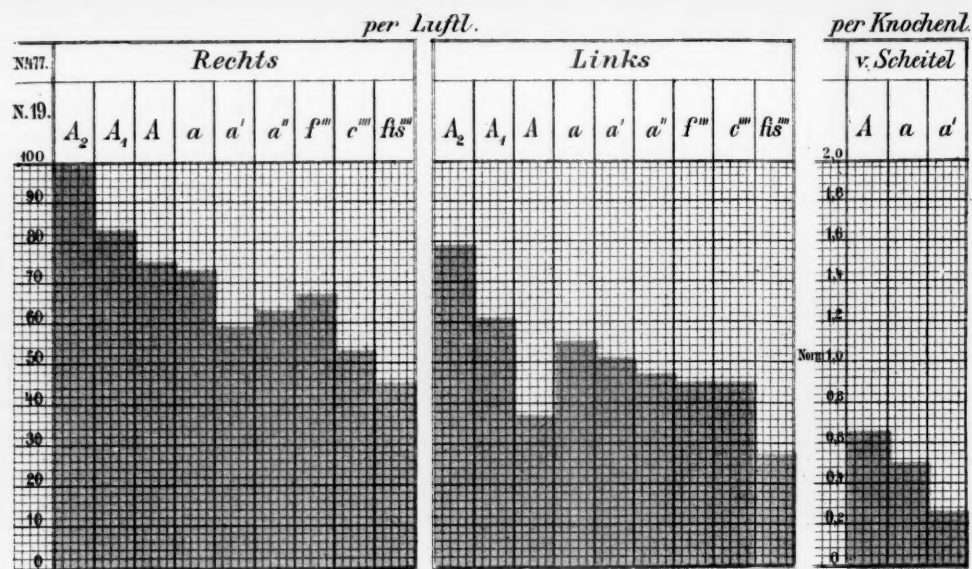


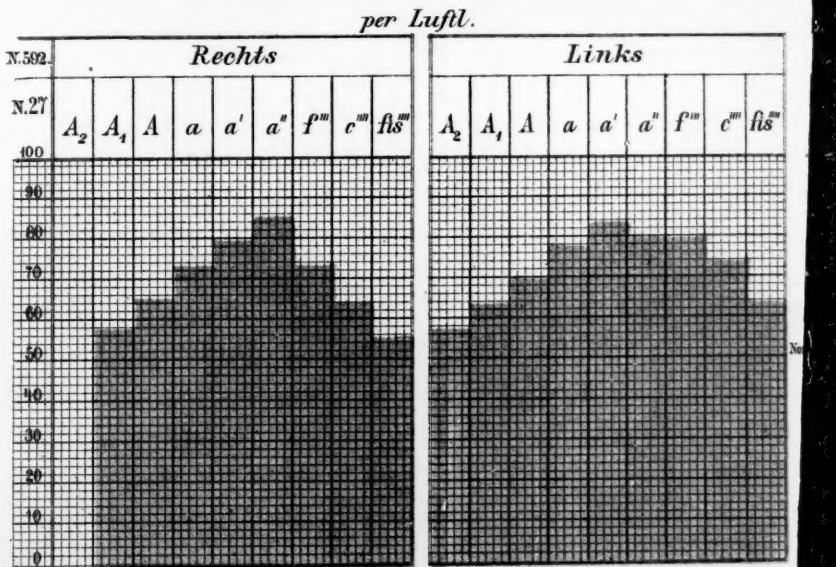
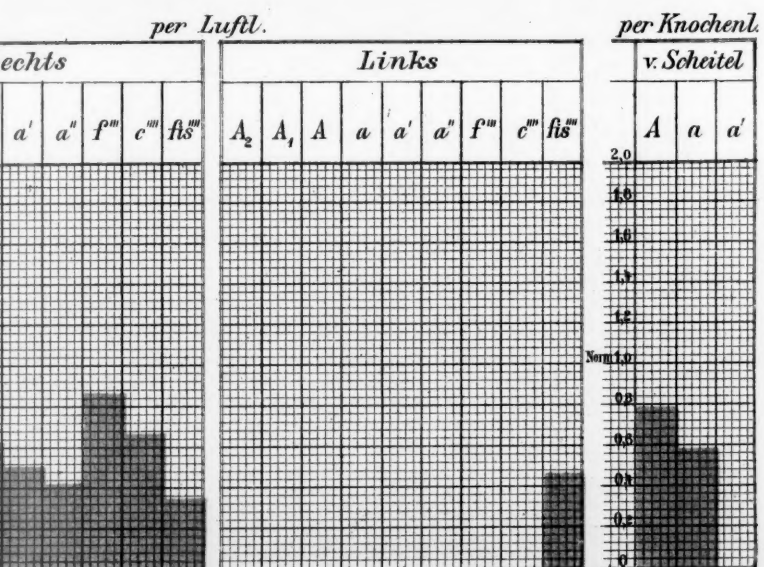
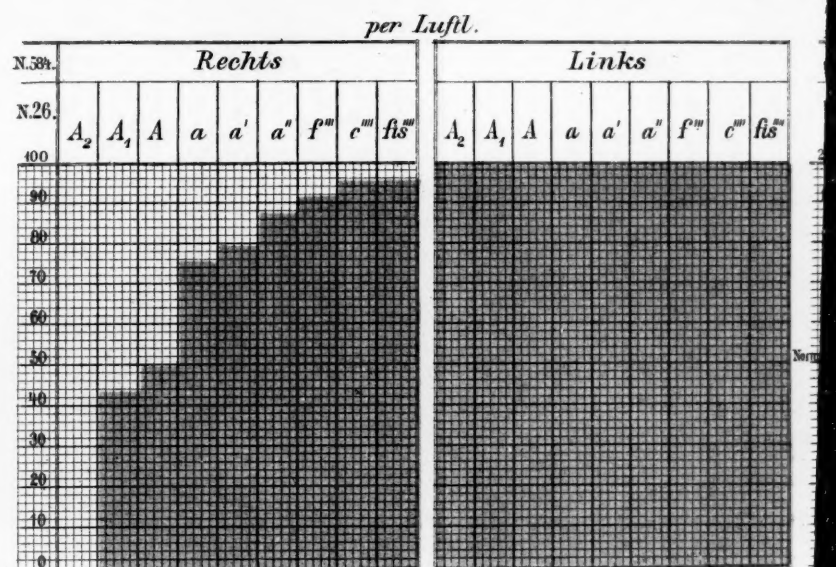
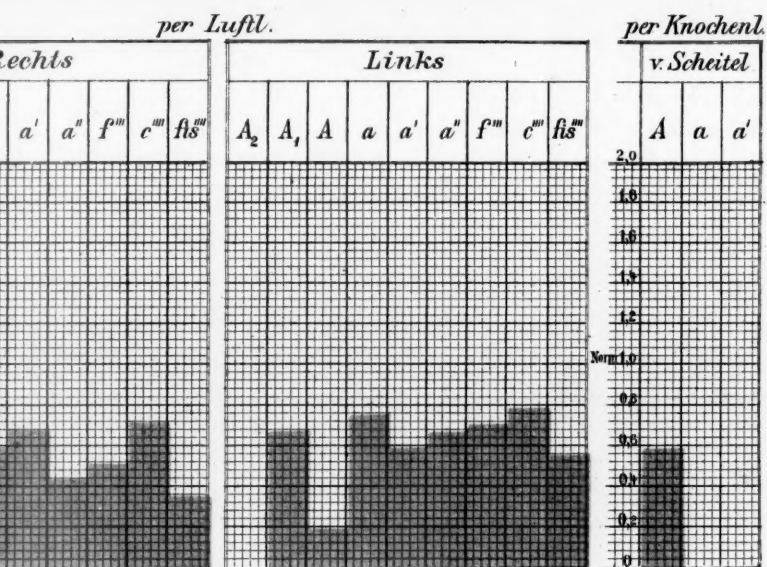
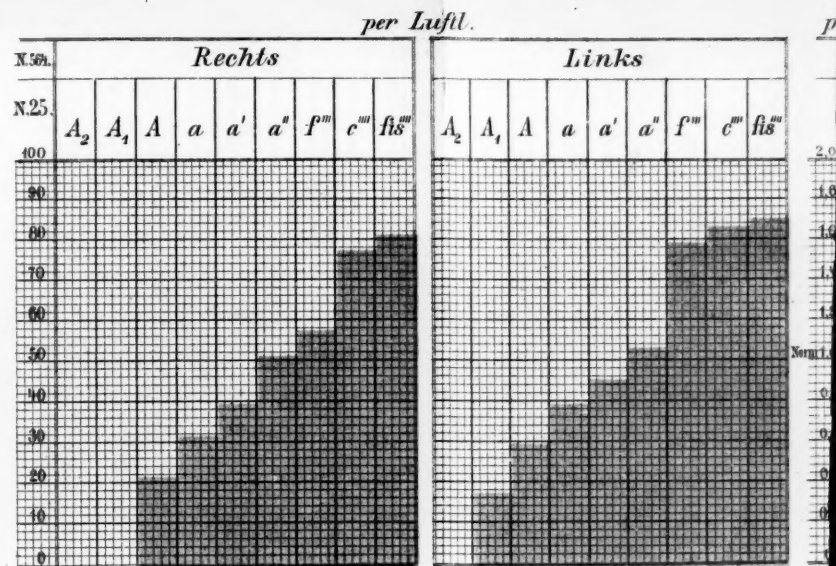
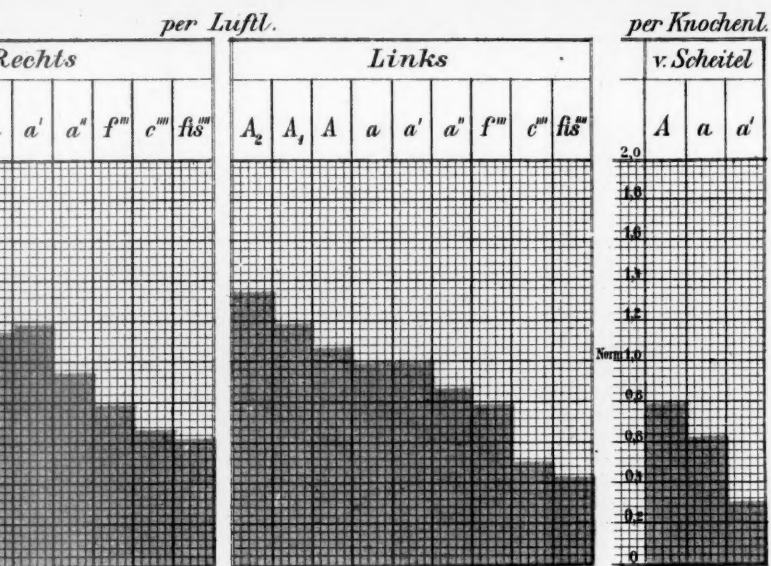
per Luftl.

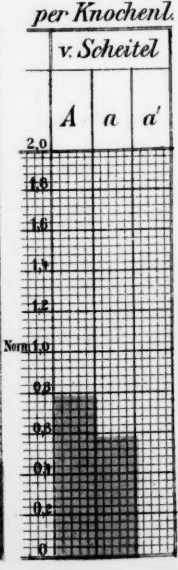
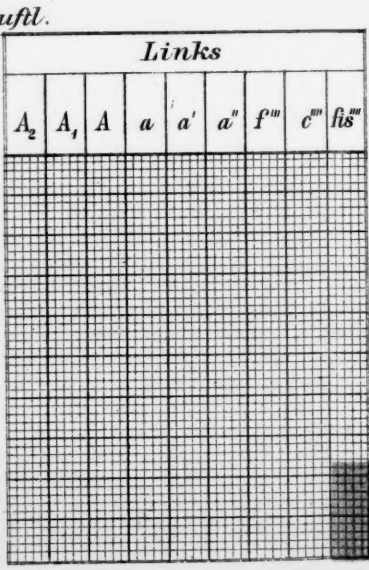
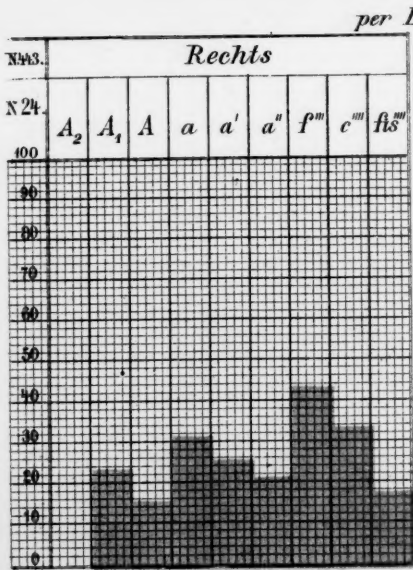
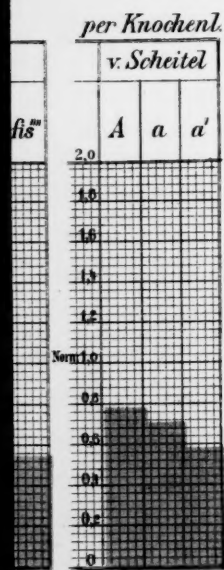
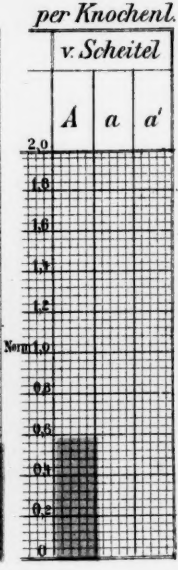
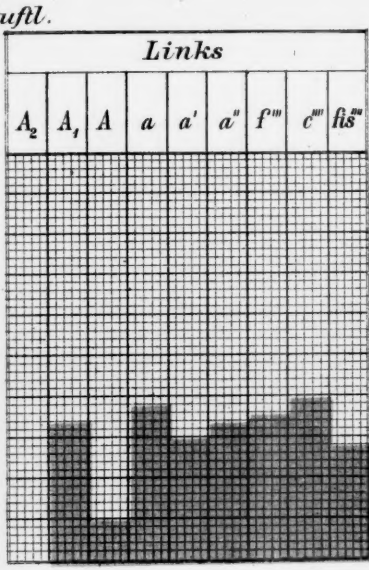
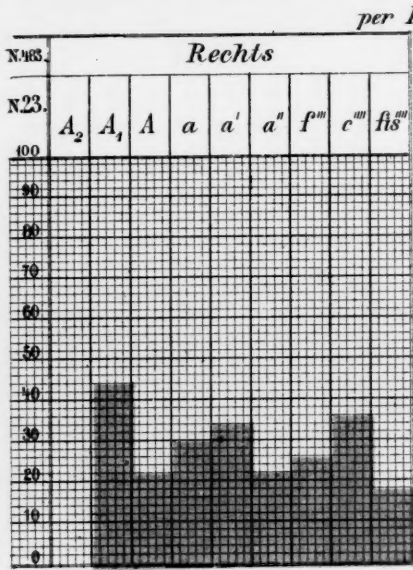
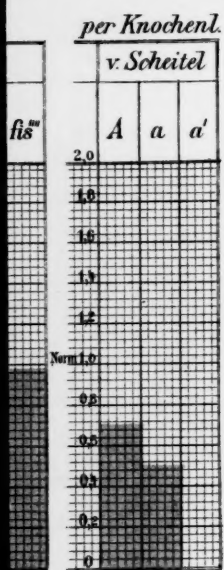
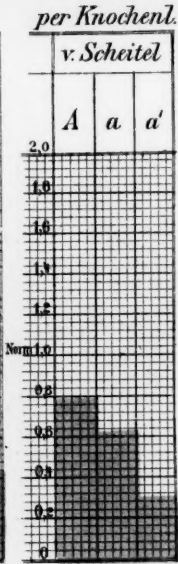
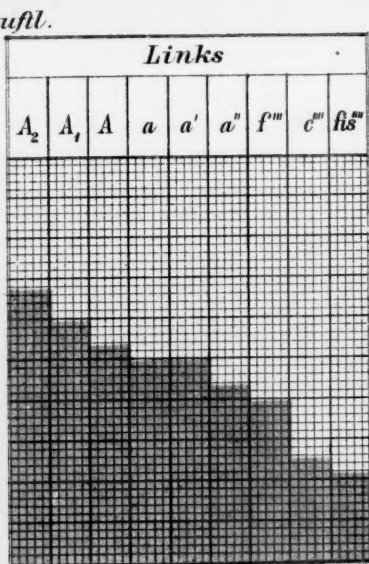
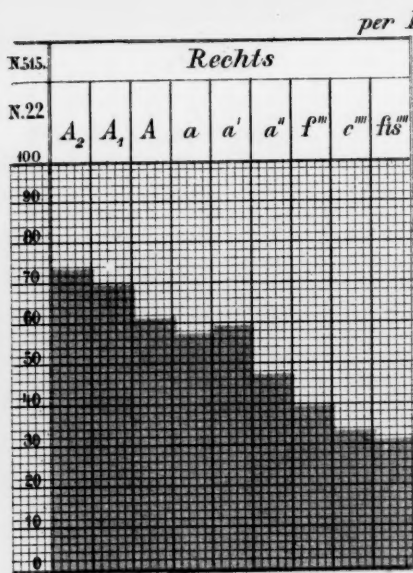
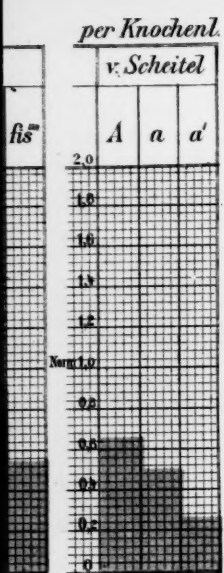


per Knochenl.





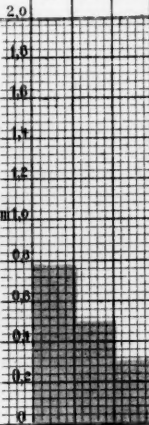




Tafel III.

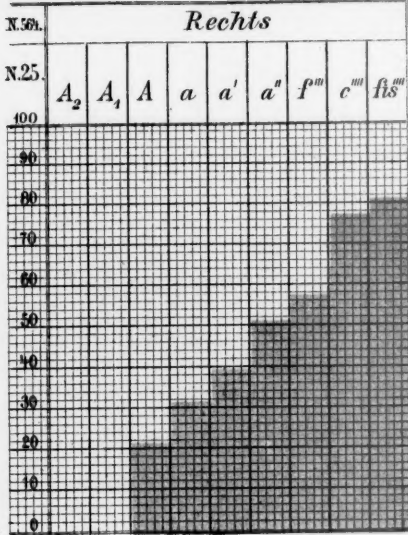
per Knochenl.

v. Scheitel

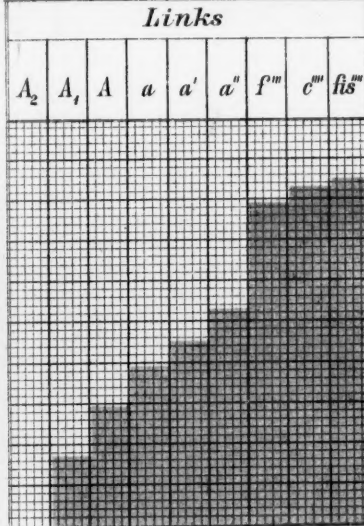


per Luftl.

Rechts

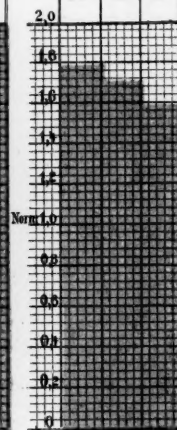


Links



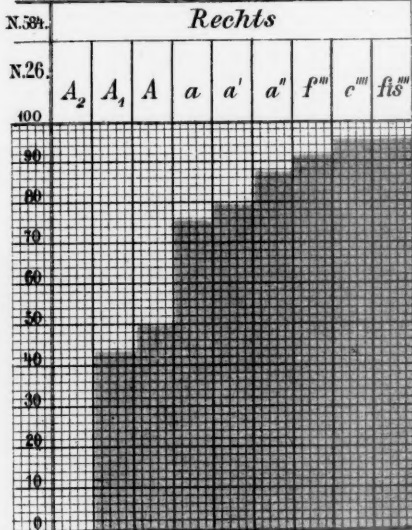
per Knochenl.

v. Scheitel

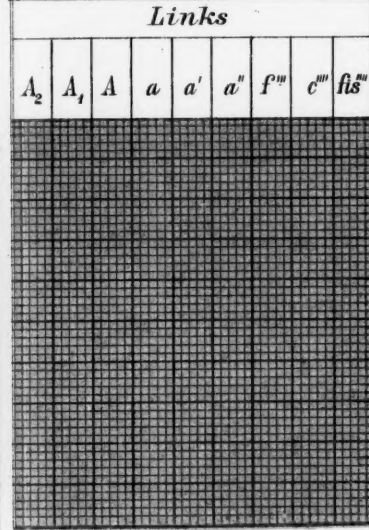


per Luftl.

Rechts

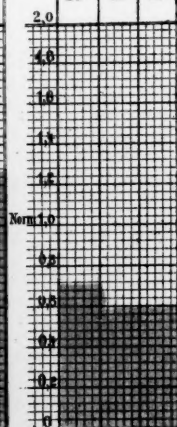


Links



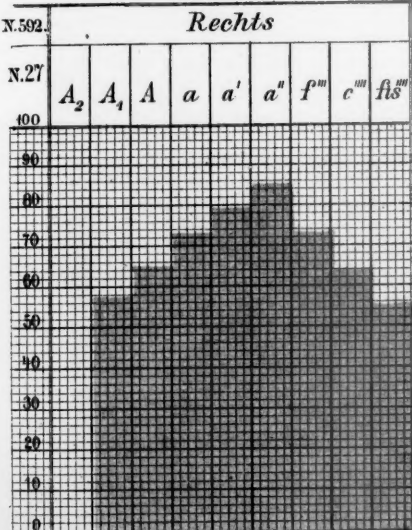
per Knochenl.

v. Scheitel

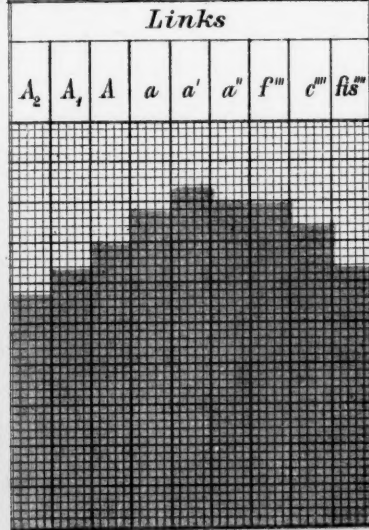


per Luftl.

Rechts



Links

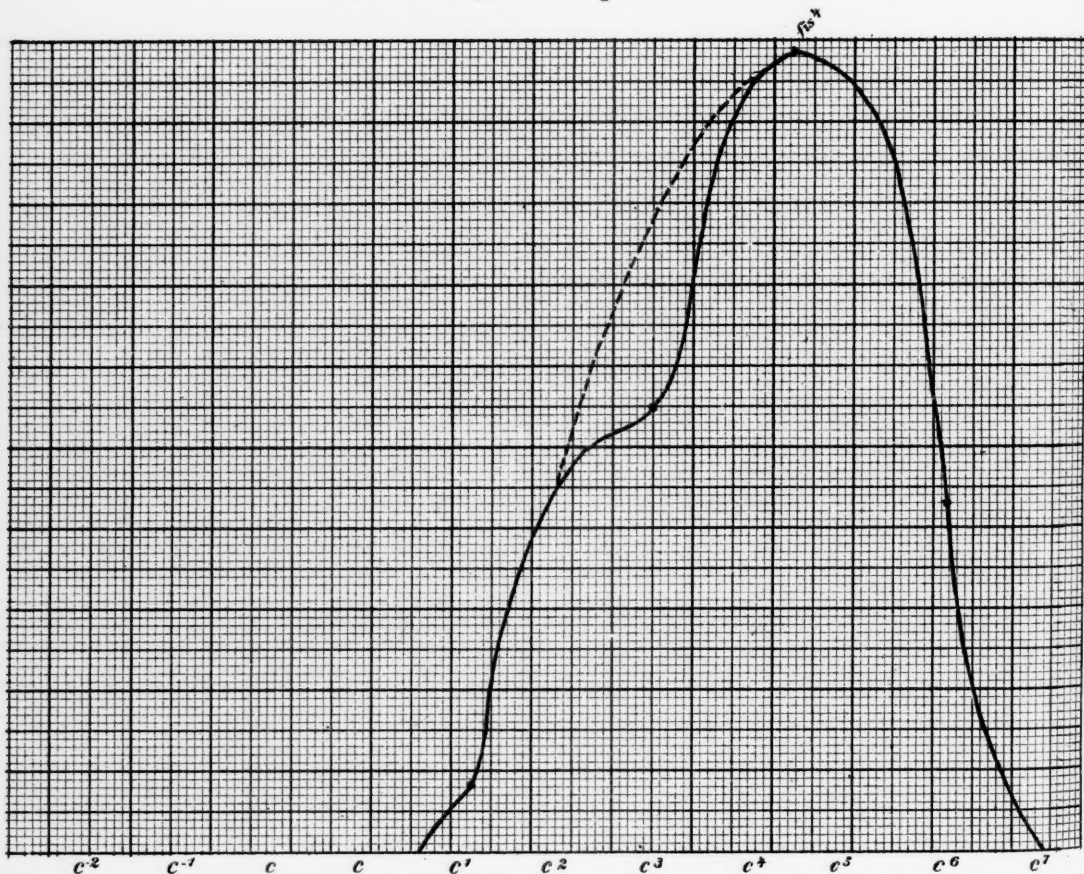




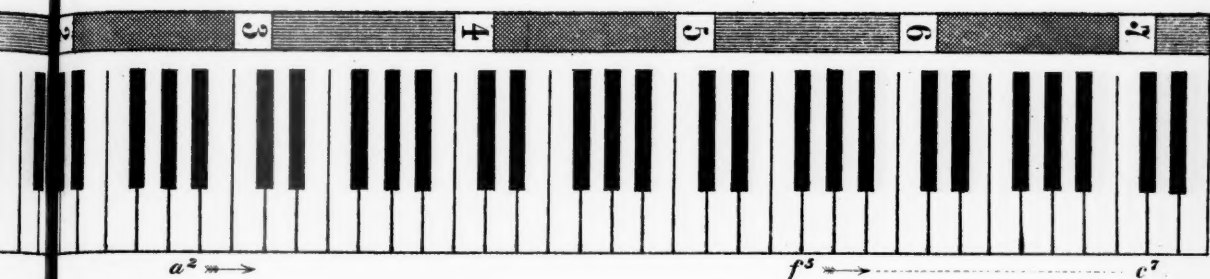
Umfang der menschlichen Tonleiter mit der
 (N. B. Die Scala verliert durch Presbyacsis alle untere

Abb. 2.

Sclerose-Hörfeld (vorgeschrittener Fall.)



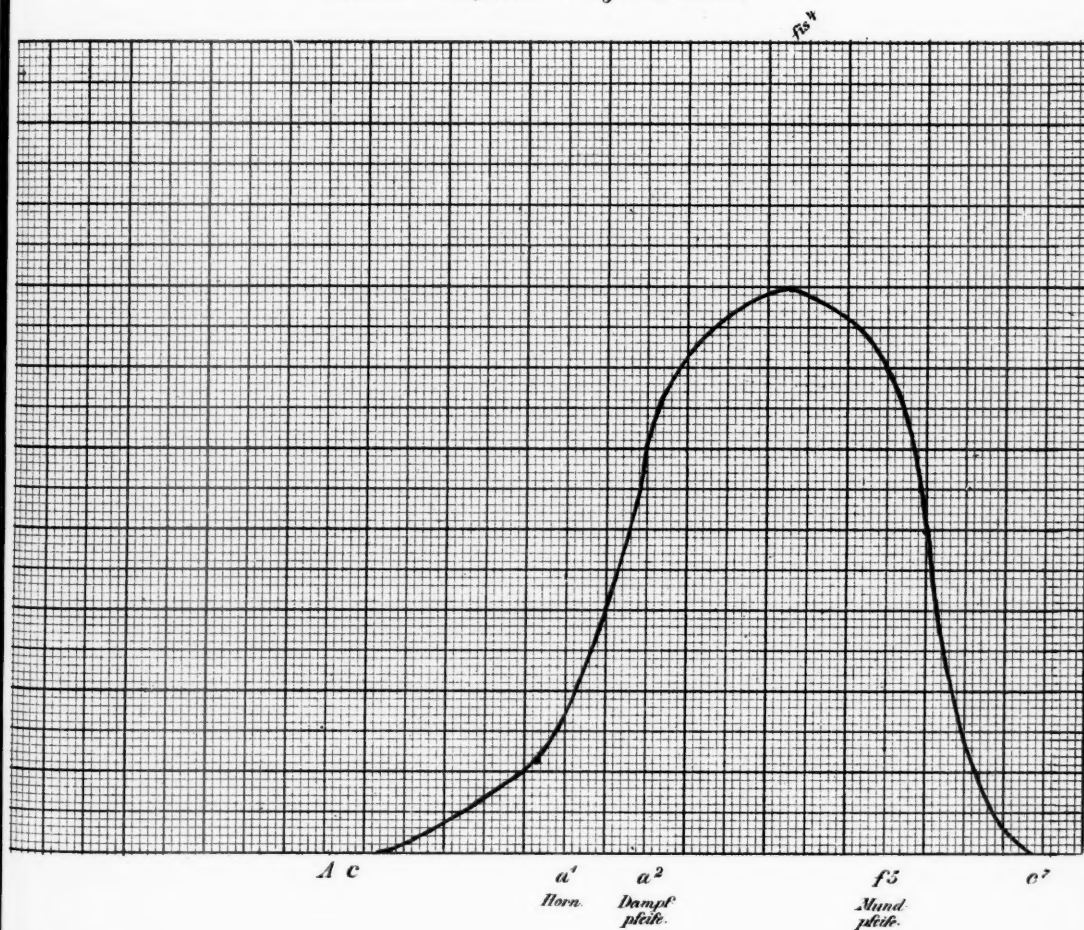
N.B. Die punktirte Linie bezieht sich auf meine vereinfachte Methode.



r. m. d. der Lage der Eisenbahnsignale
s. allen unteren Grenze 3, an der oberen 5 Halbtöne.)

Abb. 3.

Sclerose-Hörfeld (30j. Maschinist.)



ARCHIVES
OF
OTOLOGY

EDITED IN ENGLISH AND GERMAN

BY

DR. H. KNAPP

OF NEW YORK

DR. O. KÖRNER

OF ROSTOCK

DR. A. HARTMANN AND DR. U. PRITCHARD

OF BERLIN

OF LONDON

OCTOBER

NEW YORK

G. P. PUTNAM'S SONS, 27 & 29 WEST 23D STREET

AND NEW ROCHELLE, N. Y.

LONDON: 24 BEDFORD STREET, STRAND

WIESBADEN: J. F. BERGMANN'S Verlag

PARIS: J. B. BAILLIÈRE, 19 Rue Hautefeuille

1896

Price, per Number, \$1 25 (5s. 6d.); Per Year, \$4 00 (16s.)

Ophthalmology and Otology, together, per year, \$9 00 (£1 16s. 6d.)

Entered at the Post-Office, New Rochelle, N. Y., as Second-Class Mail Matter

I. ARCHIVES OF OTOTOLOGY,

PUBLISHED IN ENGLISH AND GERMAN IN NEW YORK AND WIESBADEN

BY

Drs. H. KNAPP in New York, **O. KÖRNER** in Rostock, **A. HARTMANN**
in Berlin, and **U. PRITCHARD** in London

IN CONJUNCTION WITH

Dr. CRESSWELL BABER, of Brighton, England ; Dr. GORHAM BACON, of New York ; Dr. THOMAS BARR, of Glasgow ; Prof. A. BARTH, of Breslau ; Prof. E. BERTHOLD, of Königsberg ; Dr. G. BRUNNER, of Zurich ; Dr. SWAN M. BURNETT, of Washington ; Sir W. B. DALBY, of London ; Dr. E. FRÄNKEL, of Hamburg ; Dr. E. GRUENING, of New York ; Prof. A. GUYE, of Amsterdam ; Dr. A. HARTMANN, of Berlin ; Dr. A. HEDINGER, of Stuttgart ; Dr. C. J. KIPP, of Newark, N. J. ; Dr. B. LOEWENBERG, of Paris ; Dr. F. M. PIERCE, of Manchester ; Prof. E. DE ROSSI, of Rome ; Dr. JAS. A. SPALDING, of Portland, Me. ; Prof. H. STEINBRÜGGE, of Giessen ; Dr. C. TRUCKENBROD, of Hamburg ; Dr. O. WOLF, of Frankfort-on-the-Main ; and many others.

The *Archives of Otology* will be issued four times a year, and each yearly volume will contain about 400 large octavo pages, handsomely printed and illustrated.

The subscription, per year, will be \$4.00, and the price, per number, \$1.25.

II. THE ARCHIVES OF OPHTHALMOLOGY will be published four times a year, and each yearly volume will contain about 500 octavo pages, handsomely printed and extensively illustrated with wood-cuts and lithographs.

The subscription, per year, will be \$5.00, and the price, per number, \$1.50.

These journals will continue to publish original papers of standard value, comprehensive articles on subjects still under discussion, and systematic reports on the progress of Ophthalmology and Otology, thus keeping their readers informed of everything that is interesting to know, scientifically of importance, and, above all, practically useful.

Communications relating to Ophthalmology should be addressed to Dr. H. KNAPP, 26 West 40th Street, New York, N. Y., and those relating to Otology either to Dr. H. KNAPP, New York, N. Y., or to Dr. U. PRITCHARD, 26 Wimpole St., London, W., England ; those relating to the business of the journals to the publishers,

G. P. PUTNAM'S SONS, Publishers and Booksellers,

New York :
27 & 29 West Twenty-third Street.

London :
24 Bedford Street, Strand.

Dr. JULIUS FEHR'S
"COMPOUND TALCUM"
"BABY POWDER."

The "Hygienic Dermal Powder for Infants" and Adults.

Originally investigated and its Therapeutic Properties discovered in the year 1868, by Dr. FEHR, and introduced to the Medical and the Pharmaceutical Profession in the year 1873.

COMPOSITION:—Silicate of Magnesia with Carbolic and Salicylic Acids.

PROPERTIES:—Antiseptic, Antizymotic, and Disinfectant.

Useful as a **GENERAL SPRINKLING POWDER**, with positive Hygienic, Prophylactic, and Therapeutic properties.

Good in all Affections of the Skin.

SOLD BY THE DRUG TRADE GENERALLY.

Per box, plain, 25c.; perfumed, 50c. Per dozen, plain, \$1.75; perfumed, \$3.50.

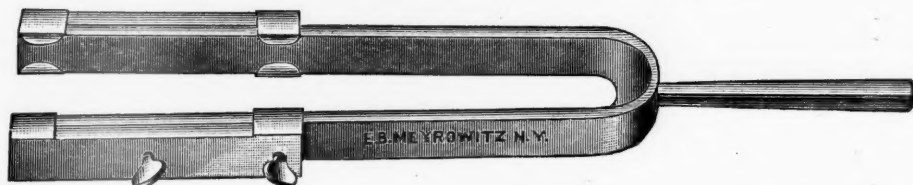
The Manufacturer: **JULIUS FEHR, M.D.**, Ancient Pharmacist.

Established since 1859 in **HOBOKEN, NEW JERSEY.**

Only advertised in Medical and Pharmaceutical prints.



DR. DENCH'S TUNING FORK.



This fork is designed to obtain a lower range of scale than is contained in the Hartman set. The number of its vibrations are regulated by the clamps. The fork without clamps gives 64 v. s.; with clamps flush with end of prongs, 40 v. s.; with clamps projecting half their length beyond the prongs, 30 v. s.; and with clamps projecting to maximum, 26 v. s.

Price, \$6.00.

E. B. MEYROWITZ, Optician,
 AND MANUFACTURER OF
 Ophthalmological Apparatus, Storage Batteries,
 and High Grade Eye, Ear, Nose,
 and Throat Instruments.

102 East 23d Street,

NEW YORK

NOW READY
A Text-Book for Training Schools for Nurses

By P. M. WISE, M.D.

Medical Superintendent St. Lawrence State Hospital; Editor of the State Hospitals Bulletin;
 Professor of Psychiatry, University of Vermont; Member of the American
 Medico-Psychological Association, etc.

With an Introduction by **DR. EDWARD COWLES**
 Physician-in-Chief and Superintendent McLean Hospital

Two volumes, 16mo, illustrated, sold separately, each \$1.25

This work will, it is believed, supply a present need for training schools. It is distinctly a text-book for training schools as distinguished from a text-book for nurses, and its arrangement provides for all the recitations in a two years' course. The first volume is divided into thirty recitations or chapters, and includes anatomy, physiology, hygiene (and allied subjects—the atmosphere, ventilation, etc.), the sick-room, infection and disinfection, observation of symptoms, clinical recording, etc. Its arrangement is based upon a graded system of teaching; the first volume being adapted for the first year's course. The second volume completes the course and provides for every subject usually taught by recitation in schools for nurses, leaving no requirement for auxiliary books. In fact the two volumes furnish completely all the requirements of the training school for a text-book.

SCHOOL OF OPHTHALMOLOGY AND OTOTOLOGY

AT THE

N. Y. OPHTHALMIC AND AURAL INSTITUTE,
44 & 46 East 12th Street, NEW YORK.

A *regular course* of instruction is given uninterruptedly from October to the middle of June, inclusive, comprising the following studies :

1. Dispensary Practice of Eye, Ear, Nose, and Throat. Daily from 2 to 4 o'clock.
2. Regular Clinics in Dispensary, Hospital, and Operating Room. Held by Dr. HERMAN KNAPP, daily from 3 to 5 o'clock. \$5 a month.
3. Practical Exercises in Operating on the Eye and Ear in the Deadhouse and Laboratory. By Dr. R. O. BORN. \$15.
4. Physical Diagnosis of Eye Diseases. By Dr. F. O. D'OENCH. \$10.
5. Refraction and Motility of the Eye. By Dr. H. H. TYSON. \$10.
6. Diagnosis and Treatment of Ear, Nose, and Throat Diseases. By Dr. M. TÖPLITZ. \$10.
7. Histology and Bacteriology of the Eye and Ear. By Dr. W. A. HOLDEN. \$15.

Fee for the whole regular course of one year, \$100; for examination and certificate of proficiency, \$15.

As *special studies*, are offered:

- (a) Topographical Anatomy of the parts concerned in the operations on the Eye, Ear, Nose, and the Surrounding Cavities, in the forenoon. By Dr. ARNOLD H. KNAPP. \$15.
- (b) Physiological Optics and Acoustics applied to Ophthalmology and Otology. By Dr. A. DUANE. \$10.
- (c) Original Investigations in the Laboratory of the Institute.

The School is only for Graduates of Medicine. They can enter at any time, select their studies, and pursue them as long as they choose.

The Institute grants the following **certificates** :

1. **Certificate of Proficiency** to those who attend the regular course and pass a satisfactory examination, in writing, orally, and practically. Signed by the President, Vice-President, Secretary, and the teachers of the Institute.
2. **Certificate of Attendance** to those who attend the full course, without undergoing an examination. Signed by the teachers.
3. **Certificate of Attendance to Single Courses**, specifying the study and time of attendance. Signed by the teacher.

For further particulars apply to

DR. H. KNAPP, 26 W. 40th Street, New York.

K.

m
w-

to

ld

se

Or.

A.

or

on
on.

nd

an
ng

and
lly.
ers

ith-

udy

r.